PERCEPTIONS OF ETHNICITY, LOCAL KNOWLEDGE AND SUSTAINABLE LIVELIHOODS IN RELATION TO DRR: THE CASE OF NSUKKA IN SOUTH-EAST NIGERIA

A thesis submitted in partial
fulfilment of the requirements of the
University of Northumbria at Newcastle
for the degree of Doctor of Philosophy

NNAMDI GREGORY ILOKA

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ABSTRACT

This research evaluates how cultural factors impact the response to adverse events. Vulnerability is a function of socio-economic conditions which may be accentuated by adverse conditions. Population growth, socio-economic structures, culture, scientific and local knowledge, and the approach to climate change are some of the factors which influence vulnerability to hazards in local communities. These factors shape the perceptions of individuals in communities towards hazards and disasters, perceptions which could lead to increased vulnerability or efficient adaptation and mitigation initiatives. This research takes an interdisciplinary approach to assess the perceptions of the Nsukka people of Enugu state, Nigeria, towards hazards and disasters, and to understand how government influence, local knowledge and livelihood assets determine the vulnerability of households to hazards and disasters in local communities. The objectives of the research are to ascertain how the combination of local perceptions, local culture and livelihood assets influence hazards and disasters in Nsukka communities. The research also reviews the role of government in Nsukka communities' hazards management. To attain these objectives, mixed methods encompassing qualitative and quantitative approaches were used to gather data. An initial pilot study was undertaken to ascertain the hazards and disasters affecting communities in different states in South-East Nigeria. During the main study, purposive sampling method was used to select the communities in Nsukka where semi-structured interviews were used to gather data from respondents. Questionnaires were also distributed to a group of respondents in the communities involved with disaster risk reduction at the local level.

The findings from the study show that communities are continually affected by different hazards and although local communities are aware of these hazards, their perceptions to what constitute local hazards differ, from perceptions in terms of existing environmental conditions to perceptions in terms of general conditions which increase vulnerability. Corruption in government, lack of trust in the political system and non-commitment of relevant stakeholders increase vulnerable conditions in local communities. Findings suggest that the perceptions of people from other regions of the country towards Nsukka for its role during the Nigerian Civil War (The Biafran War) has led to lack of trust and ignorance from relevant stakeholders, which has increased the vulnerability of the communities to hazards. Nsukka is located at the border between South-East and Middle-Belt Nigeria. The combined effects of desertification in Northern Nigeria and migration of herdsmen to farming communities are creating new conflict hazards. The study also found that ignored communities develop reliance on each other over time, making use of few available assets to tackle vulnerability due to decades of unsustainable development. The research found that self-reliance has helped local households survive the impacts of hazards for generations. Individuals and households in local communities usually deal with hazards and disasters using personal ideas and local knowledge of their environment, together with the help of livelihood assets, especially social assets. Findings suggest that local culture and tradition has also influenced the impacts of hazards and livelihoods in communities. While local knowledge and local culture has helped with adaptation to the hazards which exist in local communities, some aspects of local culture could increase the vulnerability of some groups such as women, to hazards in local communities.

While there are some initiatives by government and some stakeholder agencies to mitigate the impact of hazards in some Nsukka communities, the research shows that some of these initiatives have not been very effective due to diminished resources, education, information and coordination. Other findings from the research show that local people have limited understanding on the concept of climate change. Respondents in local communities highlight traditional, cultural and religious factors as the reasons for the changing climate, despite increasing heatwaves and variable rainfall patterns which have led to unpredictable planting seasons and has also contributed to floods and expansion of erosion in local communities. This research further suggests that communities continue to carry out their daily activities in the presence of hazards and households are more interested in resources essential for daily survival than in resources necessary to reduce vulnerability to hazards. The findings from the research point to the need for improved social protection for local communities, while using knowledge from the communities to develop disaster risk reduction strategies suited for different communities. The study is limited to Nsukka communities and Enugu state of Nigeria; however,

findings from the research lead to recommendations for efficient disaster management and risk reduction strategies for stakeholders in developing countries context. Vulnerability assessment in local communities is essential in the development of hazards and disaster management plans for communities. Hazards information shared through credible channels between local communities and governments at all levels creates a platform for effective disaster management policies from a bottom-up approach.

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DEDICATION

To Anne and Francis Iloka, for your sacrifices and dedication,
To Ugochi, for your love and friendship,
And to the memory of Tochukwu Anosike.

Acknowledgements

Firstly, I want to thank God Almighty for keeping me and guiding me through this doctoral process. There were lot of challenges along the way but God never left my side. My heartfelt thanks and gratitude goes to my supervisory team. First, to Dr Geoff O'Brien, my principal supervisor; thank you for your guidance and dedication throughout this process. I am immensely grateful for your combination of strong, critical and kind words, as well as your professional thoroughness; these have made me a better person and confident researcher. Thank you for being the best supervisor, teacher and friendly adviser anyone would ever need. I am grateful to Professor Phil O'Keefe for always creating time to listen to me and give invaluable suggestions and criticisms throughout this research process. You have been a granddad to me in the department. I appreciate all you did for me throughout this research process. I am thankful to Dr Janaka Jayawickrama, who was on my supervisory team in the first year of my program but later left for another university. Thank you for opening my novice mind in the beginning to the vast world of research. This research gave me the opportunity to meet other wonderful people in the university. I am grateful to Professor Andrew Collins, for your good lessons and to Dr Samantha Jones, for all the books! To my research friends from the department; Seema, Turki, Sara and Ibrahim, you have been amazing. I am glad this process made our paths cross and I am grateful for your friendship.

This research would not exist without the respondents in the field who shared their knowledge with me. I am immensely grateful to the respondents in Nsukka communities, who were open with information about their communities and others who directed me to sources of information. It was an unforgettable experience being in the field and I appreciate the hospitality I received in communities in most cases. I am grateful to the key respondents from the local communities and organisations whose valuable information helped shape this research. Finally, I am thankful to my family and friends. To my mum, thank you for always having my back. To my dad, thank you for checking on me every single day! To my dear wife Ugochi, I would not have done this without you. Thank you for listening to my cries, my laughter, for bearing my joys, pains and moods. Without you, I could not have achieved this. You are my rock and stability, thank you for keeping me sane! To my sisters, Ijeoma and Azokam, thank you for love, prayers and belief in me. To my little man Kenenna, thank you for bringing so much light into my life. Daddy loves you. To my friend Enyinnaya, thank you for always being there and all the best as you work towards the completion of your own research. You are all loved and appreciated.

Author's Declaration

I declare that the work contained in this thesis has not been submitted for any other award and that it is all my own work. I also confirm that this work fully acknowledges all opinions, ideas and contributions from the work of others.

Any ethical clearance for the research presented in this thesis has been approved. Approval has been sought and granted by the Faculty Ethics Committee/University Ethics Committee.

I declare the Word Count of this Thesis is 81,005 words.

Name: Nnamdi Gregory Iloka

Signature:

Date: June 2017

1.0: INTRODUCTION

1.1: Background to the Study:

The word 'ethnicity' has various meanings; its meaning is dependent on the context in which it is being used. It could be used to describe an individual's race, origin and general identity (Barth, 1969). The term can also be used to describe the use of cultural indicators by a people, to outline their social differences from others (Gabbert, 2006). These cultural indicators determine how particular ethnic groups do things or find ways for doing things. They involve the beliefs, knowledge and habits which determine how members of a community or in this case, ethnic groups, tackle issues in their daily lives (Kulatunga, 2010). It has been argued that ethnic differences play a vital role in how communities respond to hazards and disasters. Variations in vulnerability and exposure are some of the factors that influence how ethnic groups are affected by hazards and disasters. Variations in exposure are influenced by level of education, wealth and poverty levels, location and hazardous settlements (Quarantelli, 1994). On the other hand, limited access to resources, poor economic conditions and adverse social influences determine ethnic groups' vulnerability to hazards and disasters (Kaniasty and Norris, 1995). It has also been argued that cultural perceptions and beliefs play major roles in influencing the way ethnic groups respond to stressors in their communities (Allen, 1996). The culture of a people plays a key role in disaster risk reduction. Failure to recognise the influence of people's culture and its significance in everyday lives has been known to lead to increased vulnerability to hazards (Oliver-Smith and Hoffman, 1999). The perceptions of the members of communities are forged by their cultural understanding, forming their beliefs and approaches to certain situations. Such beliefs and approaches play important roles in disaster risk reduction in communities (Kulatunga, 2010). The culture of a people forms a hub for knowledge. Since culture passes from generation to generation, it becomes not just a way of life for people but also a means through which knowledge is gathered. At the local community level, this knowledge is local or indigenous knowledge. Indigenous knowledge is valuable knowledge which has been passed down through generations within local communities. This knowledge is 'indigenous' to a people, tribe, ethnic group or community (Agrawal, 1995; Arunotai, 2008, Iloka, 2016).

Local knowledge plays a key role in the management of hazards and disasters, as well as in the development of various policies necessary for efficient disaster risk reduction, especially at the community level. Its importance has been recognised by the Hyogo Framework for Action 2005-2015 (HFA) (Shaw *et al.*, 2008) and more recently, the Sendai Framework for Disaster Risk reduction 2015-2030 (SFDRR) (UNISDR, 2015). The Hyogo framework for Action was adopted at the World Conference on Disaster Risk Reduction held in Hyogo, Japan in 2005, while the Sendai Framework was adopted at the Third United Nations World Conference held in Sendai, Japan in 2015. These frameworks were adopted to act as guidelines for member nations to help describe, elaborate and explain the work required of various players so that losses associated with disasters will be significantly reduced all over the world. The SFDRR is a review and update of the HFA that was implemented in 2005. Nigeria being a member of the United Nations General Assembly, through NEMA (National Emergency Management Agency), submitted a report in 2007 to the office of UNISDR – United Nations International Strategy for Disaster Risk reduction (the United Nations office responsible for disaster risk reduction). The report highlighted disasters that had occurred in the country from 2004 to 2006. Disasters reported in South-Eastern Nigeria included gully erosions, landslides, fires and floods. These disasters have caused fatalities, displaced communities and increased people's vulnerability (UNISDR, 2007). In 2014, NEMA sent another report to UNISDR on the implementation of the HFA in Nigeria. The report highlights insufficient funds, diminished capacities and inefficient policies as some of the challenges faced by the Nigerian government in implementing effective DRR initiatives in the country (UNISDR, 2014). While it is important to understand how the government works towards DRR, it is even more important to understand how local people perceive disasters and have been working towards DRR without government help. The importance of understanding local strategies for mitigation and adaptation cannot be overemphasized.

1.2: Research Aims and Objectives:

This research is aimed at trying to understand the perceptions of individuals and households within and around the Nsukka area of Enugu state, towards issues of hazards and disasters in their communities. These perceptions are influenced by a variety of factors from within the community and from outside the community. People's perceptions to hazards and disasters usually play an important role in determining the impact such hazards and disasters have within the community. These perceptions are shaped within culture and presented as indigenous knowledge. To understand the perceptions of members of the community, the research also aims at understanding the roles played by culture and beliefs in disaster risk reduction in the communities. In addition, the roles, strategies and impact of the government (federal, state and local governments) towards disaster risk reduction in these communities are examined in the research. The research aims to understand how local people employ adaptation strategies in their communities to cope with the impacts of hazards and disasters, as these play major roles in understanding how livelihoods are shaped and disaster risks reduced within the communities. To achieve these, the research is based on three objectives that are:

- ***How do local perceptions, beliefs and traditions influence hazards and DRR in Nsukka and environs?***
- ***How do livelihood assets influence disaster decision-making for community members in Nsukka and environs?***
- ***How do current coping strategies by the government support or deter DRR/how do these fit in line with the HFA and SFDRR objectives?***

Culture and beliefs form a major part of people's ethnicity and provide valuable knowledge at the local level. The importance of this local knowledge has been recognised by the HFA and the SFDRR. The HFA Priority 3 (***Use knowledge, innovation and education to build a culture of safety and resilience at all levels***) calls for the utilisation of knowledge gathered from all stakeholders at all levels, to ensure resilience and safety. This knowledge includes scientific knowledge from development experts and local knowledge that originates from the local communities (UNISDR, 2005). The SFDRR Priority 1 (***Understanding disaster risk***) goes a step further by stressing the need to "ensure the use of traditional, indigenous and local knowledge and practices as appropriate, to complement scientific knowledge in disaster risk assessment and the development and implementation of policies, strategies, plans and programs" (UNISDR, 2015: pg. 15). While this research tries to understand the local approaches to DRR within these communities in Nsukka, it also tries to see if these local ideologies are utilised by the government and if they influence how the government develops policies and plans for DRR in local communities.

Evidence suggests that there is a continuous increase in the vulnerability of people and assets to hazards and disasters. New disaster risks and recurring small-scale disasters continue to plague communities, especially communities in developing countries. This accounts for losses in various households. There is a need to invest more in DRR to protect lives and livelihoods of individuals, communities and households (UNISDR, 2015). It has been argued that the best way to protect the livelihoods of households and ensure sustainable development is by working towards the substantial reduction of poverty in communities. Poverty, as used in this context, does not only mean money or income; it is made up of factors such as illiteracy and lack of good services in community. High literacy levels and good services can be classified as assets needed for resilience and sustainable development. Assets are classified under social capital (such as social relations, community networks), financial capital (such as savings, pensions), natural capital (such as lands, natural resources), physical capital (such as infrastructure, roads) and human capital (such as education, knowledge) (Krantz, 2001; Morse *et al.*, 2009). In answering the second research objective, this work analyses the assets available to members of the Nsukka community and how the availability or scarcity of such assets is instrumental to DRR or increased vulnerability, respectively.

Irrespective of the importance of these assets, the government plays a significant role in DRR. The role of the government can be visualised within each of these assets. All the priorities for action in both the HFA and SFDRR highlight the importance of good and dedicated governance in ensuring DRR, which leads to sustainable development. There is need for government to engage with all stakeholders, from the household and community level, up to the global level, in developing and improving DRR strategies and policies. Policies and legislation should be developed and implemented from the community level and strengthening good governance should improve these policies and legislation for effective DRR (UNISDR, 2005; UNISDR, 2015). The strategies employed by the local, state and federal governments in Nigeria for DRR has been reviewed in this research. The effectiveness or ineffectiveness is analysed from the perspective of local people. These policies and legislation are then crosschecked with the HFA and SFDRR recommendations.

1.3: Structure of the Thesis:

1.3.1 Adapted Frameworks:

This thesis tries to understand the perceptions of the local people on hazards and disasters. It aims to do so by understanding what makes people vulnerable to hazards and disasters, the impacts of these disasters, the roles and impacts of government in reducing disaster risk. In addition, it also tries to give insights into how livelihood assets and local knowledge shape the outcome of hazards and disasters in the local communities. In trying to conceptualise these issues, the literature adapted two key frameworks and one approach as guidelines towards the goal of the research. The PAR (Pressure and Release) model highlights the progress of vulnerability from root causes to unsafe conditions (Wisner *et al.*, 2004). The Adaptive Social Protection (ASP) model advocates the need for policy interventions for local people who face new and recurring hazards. It brings together the elements of social protection, disaster risk reduction (DRR) and climate change adaptation (CCA) for effective vulnerability reduction (Davies *et al.*, 2013). On the other hand, the Sustainable Livelihood Approach (SLA) is an approach that analyses how the utilization of key assets available to local people could help in reducing vulnerability, manage the effects of hazards and disasters and promote sustainable livelihoods (Serrat, 2008). The research is focused on how people in local communities deal with every day challenges they face from hazards and how they use their assets (which includes their local knowledge) to tackle such problems. A key challenge encountered when doing research like this, which adapts various frameworks but is done at the local level, is the differences in knowledge systems. This research is based on scientific and indigenous knowledge approaches. While it is unavoidable to use both approaches to a research such as this, it is important to mention that utilization of scientific and indigenous knowledge for a project can be difficult but not impossible (Mercer *et al.*, 2010). This research utilises methodological approaches from the social sciences, although some of the methods may cut across other disciplines. However, it is important to note that the outcome of the research is dependent on the perceptions of local people from specific local communities and key stakeholders. There is no pre-defined direction the research will take.

1.3.2 Outline of Chapters:

The second chapter of the work is the main body of literature. It starts by introducing the key terms and various concepts in the field of DRR. It then progresses to what disasters are and the concept of disaster risk reduction. The chapter then critically analyses the progress of disaster management, from hazards management to vulnerability management. Focus is then turned to disasters in Africa and the role government and legislation plays in disaster risk reduction in Africa. Mitigation and adaptation strategies for DRR are reviewed, with focus on adaptation in the face of present dangers by vulnerability reduction. The need for social protection for communities is discussed and the ASP model is introduced as being important in managing vulnerability and reducing disasters. While is it recognised that government should do more for communities, it is important to note that members of local communities have always found ways of adapting to vulnerability from hazards and disasters.

The chapter concludes with the role of faith and belief systems and the role of indigenous knowledge for disaster risk reduction.

The third chapter discusses the methodological approaches of the research. It starts of by discussing the philosophical approach to the research. It then progresses to the various methods employed in gathering data, while trying to give clear arguments backing the reasons for selecting each method. The challenges and limitations faced while using each of the methods are also analysed. The limitations of the research and ethical considerations are explained in this chapter. The chapter concludes with the challenges and experiences throughout the progress of the thesis, from data collection, storage, through to data analysis. The fourth chapter introduces the study area. The fifth chapter starts the next section of the thesis, the research findings. It presents the results gathered during open-ended interviews with respondents in the community, various stakeholders and key informants. Chapter 5 presents how people perceive hazards and disasters personally, in their households and their community at large. The characteristics of the respondents are presented in this chapter. The sixth chapter presents natural hazards in Nsukka communities while the seventh chapter presents human-induced hazards in the communities. Chapter 8 presents households' vulnerability to hazards in the communities. The ninth chapter presents the work carried out by the government to mitigate hazards in the local communities. The tenth chapter is a brief analysis of the findings from the fifth chapter to the ninth chapter. The last chapter is the discussion, conclusion and recommendation chapter. The chapter reiterates the research findings and clearly demonstrates how the research questions were answered. The limitations of the thesis are discussed as well as the gaps in knowledge which further research in the field of DRR could cover.

1.4: Conclusion:

This introduction to the thesis tries to bring an insight into the nature of the research. It starts of by explaining the background to the study, then goes on to pinpoint what the researcher wants to discover using detailed research questions. These research questions are backed with basic literature from the Hyogo and Sendai Frameworks of UNISDR, which are relevant to the context of the research. The introduction chapter then goes on to mention the frameworks that shape the ideas in the thesis and concludes with the outline of the remaining chapters. The next chapter is the literature review to back the research and it begins with a conceptual framework of the contents in the literature.

2.0: LITERATURE REVIEW

2.1: Introduction:

The first chapter of this thesis introduced the research aims and objectives. This chapter will review key literature in various areas, obtained from various sources. The literature is in several sections. The first section will deal with disasters and disaster management. This begins with the introduction of key terms encountered in the field of disaster management and how they are all related. It then presents the evolution of disaster management from the focus on the impacts of hazards, to the focus on vulnerability reduction for effective DRR. Hazards and disasters in Africa are highlighted, as well as disaster management in Africa (using the Global Assessment Report to get an overview of the effectiveness of DRR in Africa). The impacts of culture, faith and local knowledge for DRR are also covered. The chapter concludes by highlighting the relevance of the literature for the thesis and how the literature helps in achieving targets set out by the research.

2.2: Concepts of Hazards, Disasters and Disaster Risk Reduction:

The earth had always been impacted by the forces of nature. Before people walked the earth, natural occurrences like earthquakes, volcanic eruptions and flooding had been occurring, leading to changes in the lives of resident species. However, the appearance of man caused these environmental events to become hazards as man's vulnerability to these events could lead to disasters (Alcantara-Ayala, 2002). Man's need for adapting to his environment led him to develop tools and as evolution continued, the development of more advanced technologies led to the introduction of new hazards. These hazards can lead to disasters caused by errors or faults in technological processes (Shaluf, 2007(1); Alcantara-Ayala, 2002). Hazards have been defined as conditions or actions that can lead to injury, loss of lives and livelihoods, destabilisation in the economy, or could also lead to destruction of the environment (UNISDR, 2009). A hazard cannot lead to disaster on its own. A combination of hazard and the element of vulnerability lead to the risk of a disaster occurring (Wisner *et al.*, 2004; Vatsa, 2004). In defining vulnerability, UNISDR describes it as '*the characteristics and circumstances of a community, system or asset that makes it susceptible to the damaging effects of hazards*' (UNISDR, 2009; pg. 34). A community is vulnerable when it lacks the capacity to prepare, cope, resist and recover whenever a disaster occurs. Vulnerability is presented as a lack of assets needed for coping or adjusting to the impact of hazards and disaster. Although vulnerability is usually regarded as being product of poverty, it is usually the product of combined factors that may range from geographic conditions to governance (IFRC, 2016; Vatsa, 2004; Wisner *et al.*, 2004). Vulnerability is the combination of numerous factors that determine the level of risk exposure of people's lives and livelihoods. Factors that determine vulnerability include, but are not limited to location of ethnic groups, social affiliations, wealth, occupation, gender, health status, age and location. Measuring vulnerability involves determining not just the immediate impact on lives and livelihoods after the impact of disasters, but also determining the impact on the future of affected individuals and communities (Wisner *et al.*, 2004).

Disasters are defined as interruptions which cripple the normal working of the processes in communities and which lead to human, environmental, material and economic losses. The impacts of disasters outweigh the resources available to affected communities to cope with the effects. Disasters are a product of hazards and increased vulnerability (Kilshore, 2003; UNISDR, 2009). Although disasters have been classified into man-made disasters, natural disasters and hybrid disasters (disasters which are a product of both man-made and natural hazards) (Shaluf, 2007(b)) and 'natural or human-induced' occurrences (Carter, 1991), it has been argued that there are no 'natural' disasters, as what are known as 'natural disasters' are caused by the vulnerability of humans to natural and environmental processes. The argument is that poor relationships between individuals in the society and their environment lead to increased vulnerability, thereby causing a natural hazard to escalate into a disaster (Wisner *et al.*, 2004; Kulatunga, 2010). Hazards that escalate into disasters are caused by poor development. Such poor development creates conditions which lead to increased vulnerability

(UNDP, 2004). Disasters have been viewed from different perspectives by various authors. Some authors view disasters as the resulting effect of triggers on climatic and natural conditions (Smith, 2001); others view it in terms of physical trauma, the effect on the economy and the impact of politics (Oliver-Smith, 1990; Oliver-Smith, 1996). In any case, what is constant is that disasters lead to losses. Disasters have been generally categorised as 'natural disasters' (which result from natural hazards), man-made disasters (which result from human error in handling processes) and hybrid disasters (which result from the combination of natural hazards and human errors) (Shaluf, 2007(b)). Most disasters are a usually a combination of natural hazards and human errors. The outbreak of disease epidemics, famine or drought can be a direct result of war in a country. Disasters which result from natural hazards tend to be reoccurring, especially in developing countries. The livelihoods and coping mechanisms of communities in the affected part of the world, tends to diminish over time (Wisner *et al.*, 2004).

The impacts of hazards such as earthquakes, erosion, floods and tornadoes have on our world cannot be overemphasized. These have made the target of achieving a sustainable world, especially in countries in Sub-Saharan Africa, more difficult by continuously posing threats (Nwokoro, 2004; McBean, 2012). Various countries usually experience one form of disaster or another. Overall, people in less developed countries and societies are more vulnerable to hazards and disasters, compared to their counterparts in developed countries (McBean, 2012). Less developed communities in Africa, Asia and South America are the most at risk when disasters occur because they do lack the capacities and capabilities to adapt and manage hazards, making them the most vulnerable to the impacts of disasters (Diagne, 2007). All these have led to a rise in global interest in disasters. This has resulted to dedicated research aimed at preventing occurrence of disasters, as well as mitigating the impacts hazards would have on the built environment (Yodmani, 2001). The impacts from disasters are felt more in developing countries than in developed countries. Earthquakes, droughts and floods cause fatalities for over 50 percent of people living in developing or underdeveloped countries, even though they account for only 11 percent of the world population exposed to these disasters. These countries suffer more losses in their economies when compared to developed nations. Natural hazards have contributed to losses in human lives, properties, socio-economic facilities and livelihoods (UNDP, 2004). It is important to note here that there are no 'natural disasters'. Natural hazards on their own do not lead to disasters. Natural hazards are always present in every life; however, increased vulnerability to hazards and poor interaction with the environment are factors which enable natural hazards to become disasters (Kulatunga, 2010). Two paradigms have always dominated disaster studies – the hazard paradigm and the vulnerability paradigms. The hazards paradigm was based on work by Gilbert White in the 1940s (White, 1945) and his PhD students (Ian Burton and Robert Kates) who argued that people perceived risks and these perceptions determine how they react to risks (Burton *et a*l., 1978). The argument goes on to suggest that hazards can be avoided to prevent disasters. However, Phil O'Keefe, Ken Westgate and Ben Wisner countered this argument in the 1970s with what became known as the vulnerability paradigm. The argument is that disasters are a product of the interaction between people and the environment in which they live in. The environment includes natural and man-made environments. Hazards are present in everyday environment and cannot be avoided. Adequate resources and structures prevent hazards from escalating into disasters. Low incomes, diminished access to resources and unemployment are some of the factors which make it difficult to mitigate the impacts of hazards and lead to increased vulnerability. This increased vulnerability then leads to disasters. Therefore, disasters cannot occur if vulnerability to the hazards does not exist (O'Keefe *et al*., 1976; Wisner, 2016).

Increased vulnerability will make it more likely that a disaster will occur. Vulnerability is usually a result of poor relationships between communities and their natural environment (Wisner *et al*., 2004). Factors that contribute to increased vulnerability may include poor urban planning, unsafe housing choices and poverty (Kulatunga, 2010). Socio-economic problems, poor infrastructure, insufficient resources and a low education also contribute to increased vulnerability to disasters for people living in developing countries (Henderson, 2004). Humans in the society tend to increase their vulnerability to natural hazards by concentrating population in a location, living in unsafe houses and poor

planning. There has been continuous flow of people and assets moving into urban areas in recent years. These people often tend to move to areas that are hazard-prone such as coastlines or earthquake-prone settlements (Wahlstrom, 2009). Factors such as religion, social values, culture and tradition may also lead to vulnerability, as people tend to prioritize these over obvious dangers (Kulatanga, 2010). There has been a global rise in disaster occurrence, with disaster risks continually on the rise in the past decades (Wahlstrom, 2009; Kulatunga, 2010). Records have shown a steady rise in hazardous events and the number of people affected by disasters in recent years is on the increase (IFRC, 2003). The impacts from natural hazards have caused major losses in human lives, as well as losses in the socio-economic and physical assets of the communities that get affected. On the long run, the impact of natural disasters can become a contributing factor to underdevelopment or slow development in the society (Kulatunga, 2010). To reduce impacts disaster risk reduction strategies are important in risk and disaster management. There is a rich source of scholarly materials which have been published over the years related to disasters. In the field of social sciences and geography, two major schools-of-thought have emerged over the years, each analysing disasters from different perspectives (Gaillard and Mercer, 2012). The first is the natural hazard paradigm, which originates from the natural sciences. The argument is that man has continued to find better ways of developing and advancing his environment. The interaction between humans and nature leads to humans utilising products obtained from nature, for expanding and creating a new form of nature. What this means is that nature is continually evolving as we humans change it to create more spaces for agriculture, production, shelters and sources of livelihood (Smith, 1984). However, with this expansion comes the risk of over-exploitation of nature that then makes humans more vulnerable to hazards. Proponents of the natural hazard paradigm argue that this over-exploitation of nature make natural events (such as rainstorms) lead to disasters (such as devastating floods). It is argued that disasters occur when individuals or communities fail to adjust their perceptions of risks associated with extreme hazards (Burton *et al.*, 1993). This approach to disasters was criticised by Smith and O'Keefe (1985), who argued that the natural hazards paradigm failed to recognise 'nature' and 'human nature' as two variables which could be misinterpreted. The natural science and social science fields understand the term 'nature' from two different perspectives. Natural science excludes the human factor in its interpretation of 'nature' while social science is interested in 'human nature' (Smith and O'Keefe, 1985).

As has been previously mentioned, work by O'Keefe *et al* (1976) showed that increased vulnerability caused by socio-economic issues influenced by humans, is the real cause of disasters, not just 'nature' or act of God. This led to more calls to be placed on the human aspect of disaster and less on the hazard aspect (Hewitt, 1983). This second school-of-thought which came to be known as the vulnerability paradigm, sees it proponents argue that disasters mainly affect individuals and communities who are deprived. Such individuals and communities do not have appropriate resources to manage risks, compared to other developed and more powerful communities (Wisner *et al.*, 2004). While it is important to understand disasters from the perspective of people's vulnerability, it is important not to ignore the relevance of hazards in disaster, as they must exist for disaster to occur. Since it has been agreed that disasters are not just the product of hazards but a product of the interaction of people and their environment, the environment's ability to withstand the impact of hazards go a long way in determining vulnerability. To prevent dissasters, it is important to reduce vulnerability to hazards by building capacities for disaster mitigation and adaptation in communities (Duque, 2005). Capacity-building has been defined by UNDP as the process where stakeholders create conditions which provide individuals, communities, organizations and society with the ability to solve problems and perform essential functions, using efficient policies and adequate resources (UNDP, 1998). Capacity-building is an essential part of DRR as it provides a platform for governments and development stakeholders to build resilience in communities, by providing human skills, improved resources, better structures, advanced models and methods needed for the reduction of vulnerability and tackling hazards and disasters (Amaratunga, 2010).

Various initiatives have been introduced at the global level to tackle hazards and disasters, through focusing on how these disasters directly affect people and their communities. At United Nations Conference on Environment and Development (UNCED) conference held in Rio de Janeiro from 3rd to 12th June 1992, one of the key agreements adapted was the AGENDA 21, which called for more action towards the promotion of global sustainable development. Its focal points were on promoting sustainable development through international trade, promoting policies aimed at sustainable development, ensuring that trades support the environment and vice versa, assisting developing countries financially and tackling poverty to create sustainable livelihoods for the poor. It went on to call for development and sharing of knowledge for sustainable development, formulation and implementation of policies for the environment and development especially from the local level, as well as promoting health and protecting the vulnerable. The conference also led to the creation of other agreements like the United Nations Framework Convention on Climate Change (UNFCCC) (United Nations, 1992). At the 96th Plenary Meeting of the United Nations General Assembly in 1987, the Assembly agreed on the need to adopt strategies to reduce the impacts of 'natural disasters' across the globe, with special focus on communities in developing nations. This led the General Assembly to declare 1990-2000 as the International Decade for Natural Disaster Reduction (United Nations, 1987). In pursuance of the set goals for reducing the impacts of natural hazards in the 1990-2000 decade, the World Conference on Natural Disaster Reduction was held in Yokohama, Japan from 23rd to 27th May 1994. The highlight of the conference was the adoption of the Yokohama Strategy and Plan of Action for a Safer World. The Yokohama Strategy provided guidelines on how to prevent and prepare for disasters, as well as developing mitigation strategies for disasters (UNISDR, 1994). The United Nations saw the need to create a dedicated body to specifically deal with the issues of global disasters and coordinate disaster risk reduction activities across various platforms involving member nations. This led to the creation of the United Nations International Strategy for Disaster Risk Reduction (UNISDR) in 1999, which then became a replacement and continuation of the IDNDR. In 2005, the Hyogo Framework for Action (HFA) was developed by UNISDR at the World Conference on Disaster Reduction, held in Kobe, Hyogo, Japan, from 18th to 22nd January 2005. The framework was developed to act as a guideline for promoting risk and vulnerability reduction to hazards across nations across the globe. Its priorities included ensuring that disaster risk reduction was made a priority at local and nation levels in nations, identifying, monitoring and assessing risks, improving early warning mechanisms, utilising knowledge to build resilience and safety culture at all levels, reducing risk factors and ensuring effective response to disasters by strengthening preparedness for disasters. This framework was to act as a guideline from 2005-2015 (UNISDR, 2005).

In 2015, the HFA was replaced by the Sendai Framework for Disaster Risk Reduction (SFDRR). The SFDRR was adopted at the Third United Nations Conference held in Sendai, Japan, on the 18th of March 2015. The framework is a continuation of the work already implemented by the HFA and brings in some key elements missing in the HFA. The framework calls for more emphasis to be placed on disaster risks, rather than the whole concept of disaster management. There have been improvements in disaster risk management across various countries since the adoption of the HFA and platforms such as the Global Platform for Disaster Risk Reduction (GPDRR) has helped with development of policies and learning platforms. These improvements, however, failed to curtail the impacts of disasters. Between 2005 and 2015, over 700 thousand lives have been lost to disasters on a global scale, with a further 1.4 million people injured and over 20 million people displaced by disasters. Women, children and the vulnerable were mostly affected and the economic losses within this time-frame amounted to over $1 trillion. Disasters that from the impacts of climate change are increasing and slow onset climate disasters such as drought are affecting more and more communities and households (UNISDR, 2015). It has already been shown that the changing climate is responsible for the growing frequency and intensity of disaster risks across the globe (IPCC, 2014; Kelman, 2015). The SFDRR advocates the need to prepare and plan for disaster risks, to protect livelihoods, ecosystems, health, assets and cultural heritage of communities. This goes a long way to ensuring resilience gaps identified from the HFA indicated the need to develop a framework which present actions to be carried out by governments and relevant stakeholders, who should work together towards the identification and management of disaster risks to improve resilience, hence the

development of the SFDRR. The SFDRR also advocates for more interest to be shown in improving health measures and preserving cultural heritage (UNISDR, 2015). Going through these different frameworks, some similarities and differences can be observed. The Yokohama Strategy advocated the need to improve coping strategies for adaptation and disaster recovery (Baudoin and Wolde-Georgis, 2015), while the HFA was more focused on the need to disaster risk prevention and preparedness. All three frameworks however, recognise the need to increase the involvement of local communities affected by hazards and disasters in the DRR process. However, it has been argued that the new framework for DRR, the Sendai Framework, fails to fully integrate local knowledge in DRR and focuses more on scientific knowledge (Tozier de la Poterie and Baudoin, 2015). Although globally l it appears that scientific knowledge has become the accepted way forward in tackling issues posed by disasters and climate change (Tozier de la Poterie and Baudoin, 2015). The SFDRR suggests that local knowledge be used to 'complement' scientific knowledge 'where necessary' (UNISDR, 2015: pg. 11). There seems to be a failure to recognise that this may lead to implementation problems in the future, especially at the local community level. Top-down policies which utilise only scientific knowledge continue to lead to failed DRR and development initiatives in local communities. These policies reduce the confidence of local people, as it makes local people lose faith in their local knowledge that has sustained them for generations. Bottom-up policies help to reveal disaster risks faced by communities, right from the household level (Iloka, 2016).

Yodmani (2001) noted that last few decades have witnessed a reduction in disaster risk vulnerability and attributed this to changes in human perceptions, as well as development in policies. However, it is important to mention that this may be in the context of developed countries, as communities in developing countries still maintain an elevated level of vulnerability (Olorunfemi and Adebimpe, 2008). It has been established that disasters are usually a product of a lack of understanding between the people who inhabit an environment and the environment itself. People's understanding about their environment is influenced by factors such as beliefs and culture. Culture has a huge influence in the management of hazards and disasters. This influences impacts on the development of strategies essential for disaster management (Mercer *et al.,* 2012). Understanding the culture of people in a community is essential for DRR, as the culture of a people comprises of evolving behaviours and approaches to everyday life. While it important to note that the use of scientific methods in identifying the key issues which affect communities is essential, a failure to understand how the local culture of a community influence hazards and disasters may lead to failed DRR strategies (Weichselgartner and Obersteiner, 2002). Despite the obvious threats posed by hazards, some individuals and communities do not make hazards management a priority. This may be because of their culture and traditions, their religious beliefs and the location of their communities (Kulatunga, 2010), such as the indigenous Thailand communities that live on the coast lines of the Indian Ocean (Arunotai, 2008) or the Javanese community of Indonesia that live on the slopes of an active volcano (Kulatunga, 2010). The 2004 earthquake and tsunami that affected Thailand has helped raise awareness on the importance of recognising culture and local knowledge as essential elements in the DRR process (Mercer *et al.,* 2012).

Managing disaster risks for development can be approached from two broad areas. The first is DRR, which deals with measures that are put in place to prepare for disasters and prevent and mitigate hazards. The second area is concerned with managing disaster risks through development actions, which deal with response to emergencies, relief and reconstruction for recovery. This also involves humanitarian assistance and aid. It has been documented that the greatest hindrances to disaster risk management and planning are institutional barriers, poor information structures and weak funding (DFID, 2005). Poor investment in disaster risk reduction policies in developing nations may be attributed to the availability of international aid when disasters occur. In this circumstance, the hazard which escalates into a disaster is blamed for causing damage. All involved parties fail to blame poor governance and unsustainable development, which would have prevented the hazard from developing into a disaster in the first place (Schipper, 2004). Fortunately, some aid donors are beginning to understand that aid can increase vulnerability on the long-run, as readily-available aid can cause

governments to put less effort into disaster risk management and planning (Anderson and Woodrow, 1998).

Approaches to disaster management such as political ecology, which counters the argument that disasters are 'natural' by arguing that disasters are a product of political and socio-economic concerns (Hewitt, 1983), fail to highlight the role of culture in disaster management. They state that is only a component in safety improvements planning, preferring to make materialist interpretations about the conditions that contribute to disasters. Such an approach fails to recognise that individuals that make up diverse communities relate to each other in their different languages and share indigenous habitats and ideologies, which make up their cultures. As such, one cannot appreciate disaster management at local level if one is not aware of peoples' cultures (Wisner *et al.*, 2004). A more reasonable argument is that disasters are not 'natural' but rather, the actions and activities of humans lead to the vulnerability of individuals to disasters, such as the building of unsafe houses and population surges in hazard-prone areas (Kulatunga, 2010). There is a need to integrate disaster risk reduction strategies into everyday life, to manage hazards and in so doing, minimise the possibility of disasters. There is insufficient research on the influence of culture on DRR. This has led to unsuccessful implementation of strategies that are aimed at reducing disasters, as not knowing the cultural norms of a people leads to increased vulnerability at local level (Oliver-Smith and Hoffman, 1999; Wisner *et al.*, 2004). Culture, in disaster risk reduction, is defined as a specific way of life and includes knowledge that is being passed down from one generation to the next. This knowledge, which is a product of the cultural ideologies of a community, is indigenous knowledge, specific to the said community and its people (Kulatunga, 2010).

2.3: Disasters in Africa:

Countries in Africa experience many disasters and the disaster rates are on the increase. Disasters that originate from natural hazards claim lives, destroy livelihoods and cause economic downturn in various countries across the continent. A lack of resources to manage the impacts of hazards and a growing population has increased the frequency of disasters (Lukamba, 2010). Africa is a hotbed for disasters from natural hazards, especially those that originate from hydrological and meteorological processes. Human-induced and technological disasters are also prevalent across the continent (UNISDR, 2004). These disasters are on the rise and the vulnerability of communities in different countries in Africa has led to loss of lives and livelihoods (UNISDR, 2004). Within a one-year frame (2000-2001), about 13 percent of all the people living in Africa were affected by disasters, in one way or another (UNISDR, 2004). In 2005, it was estimated that the continent was home to 880 million people, with the population rate growing at about 5-8 percent every year. This goes to show that there will continue to be a rise in the number of people who are affected by hazards and disasters in Africa. Compared to other continents of the world, Africa is the one in most need of good policy-makers, science and technology to help it towards socio-economic development. However, with Africa being home to some of the poorest nations of the world, the capacity to equip and prepare nations for disasters is low (ICSU, 2008). Hazards such as conflicts, floods, mudslides, windstorms and droughts have adversely affected sustainable development in Africa (African Union, 2006). No other continent experiences the kind of drought Africa faces. This is not to say countries in other continents do not experience disasters. The difference is that there is an elevated level of awareness and high mitigation strategies utilised in these countries. Losses from disasters in developed countries are usually insured losses (ICSU, 2007).

Of all the disasters affecting countries in sub-Saharan Africa, hydro-meteorological disasters are the most rampant. Floods, extreme temperatures, cyclones, droughts and landslides are just some of this type of disaster affecting countries in Africa. Between the mid-70s to the early 2000s, hydro-meteorological disasters accounted for 59 percent of all disasters that occur in sub-Saharan Africa, with floods and droughts accounting for the highest number of disaster occurrences (UNISDR, 2004). Amongst these disasters, floods affect 90 percent of people affected by disasters in Africa (UNISDR, 2004; ICSU, 2007). Floods constitute some of the biggest hazards in Africa. Apart from washing

away lives and livelihoods, floods also cause the spread of diseases such as malaria and cholera. Floods have affected millions of lives since the early 20th century, causing damages worth billions of dollars over the years. Floods are usually a product of prolonged periods of rains. However, man-made activities such as population increase along river banks and deforestation also contribute to flooding (ISCU, 2007). Droughts are another big problem in sub-Saharan African Africa. While floods are very rampant, droughts have been responsible for about a million deaths in Africa since the 1970s (World Bank, 2010). Although droughts are becoming a worldwide problem due of rise in global temperatures from greenhouse emissions (Burke *et al.*, 2006), they are particularly problematic in Africa. From the early 1960s, the Sahel region of Africa was affected by recurring drought. This drought lasted for over 30 years and has continued to cause devastation in this region until the present. Although poor land use and desertification which leads to land degradation had been blamed for this disaster, it has also been found out complex relationships between the elements of nature can lead to drought disaster (Foley et al, 2003; Scholes and Briggs, 2004). Between 1970 and 1974, droughts caused loss of lives, livelihoods and livestock in the Horn of Africa. In Ethiopia alone, the drought claimed 250,000 lives and over 50% of livestock during this period. Droughts in the Horn of Africa led to the death of a million people, between 1984 and 1985, and claimed a further 100,000 lives in 2000. Death is usually is a result of severe famine (Webb et al, 2001; ICSU, 2007).

There is a global rise in temperatures across the globe, with indications that temperatures are rising in North America and Europe, causing severe heatwaves. It has also been predicted that global warming will contribute to continuous rising temperatures across the globe (Meehl and Tebaldi, 2004). In Africa however, the severity of heatwaves has led to damage in infrastructure, led to the risk of illness in the elderly, young children and has led to deaths from hyperthermia. Sometimes, the heatwaves may occur during drought and has been known to cause bushfires (ICSU, 2007). Wildfires destroy homes, farmlands, livestock and cause death in Africa. In the Sudan region of Africa, wildfires account for the destruction of over 60 million hectares of land on a yearly basis (Pyne *et al.*, 2004). Some of these fires have been either started deliberately, or by human error or by lightening (ICSU, 2007). Dust storms have also been known to affect regions of Africa, due to the dryness and temperature rise. Dust storms cause changes in air quality which affects livestock and crops. Dust storms are known to aid the spread of meningitis in the Sahel region of Africa (ICSU, 2007). Hazards from geophysical sources constitute a lower ratio of disasters that occur in Africa. Two percent of disasters in Africa come from earthquakes. One percent of all disasters in Africa are caused by volcanic hazards, which can lead to tsunamis, landslides and ash pollution. Mudslides and erosions contribute to an even lower percentage of disasters in Africa (OFDA-CRED, 2002; ICSU, 2007). Disease epidemics are also one of the largest causes of disasters in Africa. Malaria kills up to 1.5 million people in Africa every year, with the highlands of East Africa being one of the regions on the continent that is mostly affected (Lindsey and Martens, 1998; Abeku et al, 2004; ICSU, 2007). Other disasters faced by countries in Africa are caused by humans. Civil wars and armed conflicts, gas flaring and oil exploration, and land degradation are the result of direct actions of humans which lead to disasters (Timberlake, 1994; Svensson and Djumena, 2002). A developing concern for countries in Africa is the rise in terrorism and insurgency. Since 2009, the terrorist group, Boko Haram, has been responsible for death and displacements in Nigeria and other neighbouring countries like Cameroon. With the bombing of the UN Headquarters in Abuja in 2011, the group established itself as a global terrorist organisation. The insurgency has led to food scarcity at times. Food prices skyrocket and traders are afraid of going to the north of Nigeria to do business. The economy is also affected by the insurgency (Alao et al, 2012). The activities of multinational corporations drilling for oil in the Niger Delta region of Nigeria has also led to environmental pollution, land degradation, waterways contamination and loss of livelihoods (Jike, 2004). Going through the literature available on disasters affecting African countries, it is observed that the greatest threats to the continent come from the impact of the changing climate. For those living in the Sahel and Southern Africa, the increase in the drier weather conditions in these regions for the past three decades, has led to the death of thousands (African Union, 2006). It has been argued that the drier weather would lead to grave impacts on agriculture and the availability of food on the continent in coming years (Lukamba, 2010). The World Health Organisation has linked the increased occurrence of disasters in Africa to an increase in the

health problems that affect members of communities (WHO, 2004). From floods in Ghana and Nigeria (Red Cross, 2008) to volcanic eruptions and earthquakes in Democratic Republic of Congo (UNDAC, 2008) and severe drought in Somalia, the African continent is one which is in a continuous battle with forces of nature (CRED, 2009). Twenty percent of global disasters affect African countries. However, 60 percent of disaster-related deaths worldwide occur in Africa. Factors such as insufficient investment in disaster management, lack of adequate channels of reporting and continuous vulnerability to hazards are just some of the reasons for the high impact ration.

There is also the issue of natural hazards combining with man-made hazards to cause more disastrous impacts, like in the situation of armed conflict and war. Disasters affect people in Africa directly and indirectly, putting strain on livelihoods and the economy (Loretti and Tegegn, 1996). Disasters in Africa also go on to affect the education of children. Between 1986 and 1987 in Ivory Coast, the enrolment rates of pre-teens and teenagers into schools fell by about 20 percent due to the impact of extreme rainfall (Jenson, 2000). In Tanzania, young male pupils have been found to work for a longer period, which reduces the time available to them to attend school (Beegle *et al*, 2006). Constant droughts in Ethiopia and Malawi have led to diminished investment in school infrastructure. When disasters occur, parents are forced to use the little resources they have left to rebuild their livelihoods first, before considering sending their children back to school. School resumption requires funds. Unavailability of funds to parents, who must build back their livelihoods after disasters, has led some pupils to drop out of school completely (World Bank, 2010). The impact of droughts to the lives of African children is overwhelming. Malnourishment has claimed the lives of African children and led to stunted growth, as had been observed in countries like Zimbabwe (Alderman et al, 2006) and Ethiopia (Porter, 2008). Continuous drought has affected agriculture and created food insecurity in Africa. Most local communities are dependent on crop production not only to feed households, but also as source of employment and income generation (GAR, 2015). The core reason for the growing problem posed by disasters from natural sources, on the worldwide stage, is climate change. Data gathered from the past three decades show that there is a link between changing climatic conditions and disasters (CRED, 2009; Lukamba, 2010). There is a high incidence of drought, water and food scarcity in so many other countries, like in Nigeria, Ghana and Mali, all located in West Africa (Lukamba, 2010). Agricultural droughts have led to diminished crop production, scarcity of water, death of livestock and wildlife, loss of lives and livelihoods (GAR, 2015). It has been predicted that by 2020, crops available for consumption on the continent will diminish, with dry lands expanding by over 5 percent (UNISDR, 2008). These disasters in Africa tend to lead to new disasters, as seen in the case where severe drought has led to recurring famine in Somalia and floods have led to outbreaks of cholera in Mozambique (IFRC, 2011). In some cases, disasters like droughts may lead to conflicts in Africa (Wisner et al, 2004). Miguel *et al* (2004) argued that a percent increase in annual rainfall reduced the risk of conflict by 6 percent in Africa. Conflicts tend to rise when the land is drier. This was the case of Fulani herdsmen and Senufo farmers in the 1980s. Supported by the government of Ivory Coast, Fulani herdsmen moved from their dry communities affected by drought, into areas occupied by Senufo farmers. The cattle of the Fulani herdsmen destroyed about 20 percent of crops owned by Senufo households, leading to conflict (Basset, 1988). Such conflicts are beginning to grow in the South-East and the Middle Belt regions of Nigeria as Fulani herdsmen and local communities clash over farmlands, leading to the deaths of people and the torching of houses. This conflict in Nigeria has been going on for decades; only recently is it beginning to escalate. Although the herdsmen are known to be nomadic, the increase in the migration of Fulani herdsmen and their cattle to the farmlands in the eastern part of Nigeria is caused by continuous droughts, deforestation and desertification in the northern part of the country. The changing climate is responsible for this, as climatic conditions are making the Sahara Desert encroach at a rapid pace across the north (Abugu and Onuba, 2015).

The changing climate has had adverse impacts on the Nigerian people for decades. These impacts are exacerbated by the geography of the country, the problems with its economy, its energy demand for a continually growing population, its flora and weather conditions (from the tropical rainforest regions in the South to the Sahel region in the North) (Adebimpe, 2011; Gworgwor, 2008). Rainstorms, drought, flooding, desertification, wildfires, oil spillages, landslides and erosions are just some of the disasters that have led to massive loss of lives and livelihoods across the country. Households are affected and vulnerability to the impacts of these disasters continues to grow (Adebimpe, 2011). People living in rural communities are the ones who suffer the most as they depend on the crops they grow and livestock they keep for their sustenance. Climate change negatively affect the livelihoods of people in rural communities, as changes in weather patterns and depleting food sources for livestock have made resources very scarce (Idowu *et al.*, 2011). This condition is made worse as there are no social safety nets in Nigeria that help local people recover from the impacts of climate change, a problem which is one of the major reasons for continued vulnerability of communities in developing countries to disasters (Ulstrud *et al.*, 2008; Adebimpe, 2011). In recent times, flooding has become the biggest disaster that is affecting Nigeria. Not only is flooding very rampant in the Southern states, it has caused catastrophe in Northern states such as Bauchi. The flooding has washed away farmlands, houses, roads and caused loss of lives (Orebiyi, 2002). Askew (1999) writes that flooding accounts for the most damages and losses from natural hazards, causing one-third of injuries, deaths and damages. The low level of risk assessment in Nigeria, continued migration to urban areas and problems with governance has led to increased vulnerability to floods (UNISDR, 2009; Darteh, 2010). Disasters in Nigeria have threatened sustainable development. Therefore, there is a need to invest more in mitigating the effects of disasters in the country to ensure that vulnerability is reduced; this will in turn improve the economy and strengthen livelihoods (Olorunfemi and Adebimpe, 2008). It is important to note that one of the key reasons why disasters affect countries in Africa is due to poverty and the inability to use resources available to sustain livelihoods. It is not all gloomy for the African region however, as it has been found that between the early 90s and 2010, the number of people living below the poverty line have fallen from 56 percent to 48 percent (GAR, 2015).

2.4: The Role of Government and Disaster Legislation in Africa:

Disasters cause a deviation from the normal way communities function, leading to losses in the economic, material and environmental assets of communities. Disasters adversely affect the economy of nations as they cause economic instability and underdevelopment, leading to loss in gross domestic product (GDP). Disasters present physical, environmental and socio-political conditions that make it difficult for people to cope, thereby increasing vulnerability and poverty (Ahrens and Rudolph, 2006). Evidence suggests that financial, administrative and political insufficiencies affect the poor in developing countries and make them more vulnerable to the impacts of hazards and disasters (UNDP, 2004). Economic instability leads to a rise in poverty levels. This leads to increased vulnerability to disasters as there are little assets available to members of the community for coping (UNDP, 2004; Ahrens and Rudolph, 2006). Therefore, there is a need for institutions and governments to work directly in providing safety nets and introduce policies with the aim of reducing vulnerability. The government is responsible for ensuring that roles of government and other related agencies concerned with disaster management are clear and understood by all stakeholders. The responsibilities to be undertaken by concerned stakeholders in the disaster management process are categorised into preparation, mitigation, response and recovery (Col, 2007).

Governments have always tried to manage disasters through the provision of relief materials to communities affected by disasters and this method is applied throughout the world (Aakre et al, 2102). However, communities in developing countries who lack adequate administrative and organisational capacities are the most vulnerable to disasters (UNDP, 2004). In other to achieve sustainable goals and development, it is important to invest in disaster management and development strategies. Failing to invest in sustainable goals leads to disaster risks. For sustainable goals to be achieved, the structure of government in developing countries must be defined. Structural failure in

government directly leads to more vulnerability to disasters and underdevelopment (Ahrens and Rudolph, 2006). In developed countries, governments are able implement a prevention culture to disasters as there are credible structures for handling government decisions. This is not the case of developing countries in Africa, where there is generally a lack of credible structures of government (World Bank, 2010). A country succeeds in disaster reduction and sustainable development when the government of that country is enlightened, committed and able to implement development policies because of its good government structures. Therefore, there is a need to build good institutions of government for disaster risk reduction and sustainable development to take place (Clague, 1997; Ahrens and Rudolph, 2006). To create a good governance structure for effective disaster risk reduction and sustainability, there must be effective and equal participation from all sectors. The rule of law must be upheld to ensure transparency and responsibility. Accountability, vision and efficiency should be at the forefront in delivering policies (UNDP, 2004). Government structures should be predicable, transparent and accountable to the masses and ensure that the masses and other stakeholders participate in its policy-making processes (Ahrens and Rudolph, 2006). While it is important for governments to invest more in disaster risk reduction, it is important to mention that disaster risk reduction is a multi-sectoral responsibility for all organisations including the private sector, households and the international community. Communities affected by disaster risks understand the disaster risks they face and their vulnerabilities; they should be empowered to tackle such hazards and disaster risks (Wisner et al, 2012).

The United Nations organisation has been a link between governments of member nations and the general international community (Gareis, 2012). In the 1990s, the United Nations organisation declared the International Decade for 'Natural' Disaster Reduction (IDNDR). The target was to ensure the reduction in lives lost, properties destroyed, and economic downturns caused by 'natural disasters'. Criticisms on the use of just scientific methods in trying to tackle disaster risks led to increased focus on the role of local vulnerability factors in the disaster management process. The IDNDR was replaced by the International Strategy for Disaster Reduction (ISDR), which was adopted by United Nations member states. These programs led governments and institutions to understand the importance of disaster risk reduction (Wisner et al, 2012). The problem for developing countries is that they have not fully invested in disaster management, as the issue of low-income and indebtedness makes it difficult. Some of these countries even have various NGOs taking on the responsibilities that normally should be government responsibilities. There have been arguments that some of NGOs carry out work for personal gains (Wisner et al, 2012; Siradag, 2015). Another issue is that of aid provision through such NGOs and developed nations for underdeveloped and developing countries. It has been argued that although aid helps in disaster prevention, it might also make countries, like those in Africa, uninterested in developing their own safety nets. The belief that foreign aid will always be provided by developed economies, in the event of a disaster, cause some African countries to invest less in disaster prevention and management (World Bank, 2010). Despite all these, many countries in Africa have made some steps in tackling hazards and disasters on their own. Although the continent of Africa has faced continuous hazards and disasters which have persisted for decades, there has been progress towards managing hazards and preparing for the impacts of these disasters. Some important initiatives have been launched to address the issues of disasters in Africa (UNISDR, 2005; IFRC, 2011).

The Hyogo Framework for Action (HFA) and the Africa Regional Strategy for Disaster Risk Reduction (ARSDRR) has created platforms that have allowed various African countries to mitigate hazards and prepare for disasters (UNISDR, 2004; UNISDR, 2005; IFRC, 2011). The ARSDRR aims to make governments more committed to disaster risk reduction. The ARSDRR wants governments to improve risk identification methods, improve monitoring and early warning systems, develop the knowledge base and awareness of disaster in communities, enhance the strengths of institutions tasked with disaster management and ensure that disaster risk reduction is a vital aspect in disaster response plans while improving emergency response (GFDRR, 2010). The ARSDRR is the brainchild of NEPAD (New Partnership for Africa's Development), which is the organisation tasked with the responsibility of promoting sustainable development and poverty reduction in Africa. It is important

to note that this strategy was developed to focus on natural hazards and resulting disasters, as well human-induced hazards and disasters that arise from conflict across the continent. The strategy highlights the need for countries to develop national frameworks for disaster management in line with the recommendations of the strategy, while leaving the task of conflict resolution to African Union Commission for Peace and Security (UNISDR, 2004). Under this strategy and the HFA, Nigeria developed its National Disaster Management Framework (NDMF) for effective disaster risk reduction in the country. The framework aims to ensure proper implementation of disaster management initiatives from the federal government, down to the local government. These initiatives are to help with mitigating and preparing for disasters, and respond to disaster situations and rebuild after the disasters. The government of Nigeria handles disaster management through NEMA (National Emergency Management Agency), established in 1999 (IFRC, 2012). Some of the responsibilities of the agency are to develop policies and coordinate disaster management activities involving all stakeholders, planning and responding to disasters in the country, and involving the private sector as well as the state governments, local governments and communities in the disaster management process (UNISDR, 2010).

2.4.1: Limitations to Disaster Legislation implementation in Africa:

Disaster legislation is essential for building community resilence and in creating a platform for managing new and recurring risks. Such legislation helps in building foundations for efficient risk management and preventing new risks, leading to safer communities. Disaster legislation also creates guidelines for disaster risk management organisations, governments and development institutions, while highlighting the roles and responsibilities of all relevant stakeholders in the disaster risk reduction process (IFRC, 2015; IFRC, 2017(b)). Government reports show that various countries have some form of disaster legislation designed for disaster risk reduction. Unfortunately, the existence of disaster legislation in countries does not mean that efficient disaster risk management is obtainable in some of these countries. Even high and middle-income countries with good legal frameworks and policies still struggle in the implementation and enforcement of efficient disaster risk reduction legislation (UNISDR, 2009(c)). Countries in Africa have lapses in financial strength, human capital and political willpower required to ensure effective implementation of disaster legislation. Several factors are responsible for this (UNISDR, 2011). One of the reasons why the implementation of disaster legislation is not concrete in African countries is the continuous provision of aid, during and after disasters, to these countries, by patrons (Riddell, 2007).

In developing countries experiencing recurring natural hazards and man-made disasters in Africa, foreign aid is provided in the form of projects, emergency and disaster refief, humanitarian aid and financial incentives. Foreign aid provides essential capital for developing nations, while creating a platform for sustainable development (Burnside, 2000; Riddell, 2007); however, such aid may have negative impacts on receipient countries. At the level of national economics, increased foreign aid could lead to inflation in receipient countries, with regards to exchange rates and domestic exports (Riddell, 2007). Research by Yang (2008) showed that foreign aid accounts for over 70% of assistance offered to developing countries affected by disasters, while Fleck and Kilby (2010) suggest that these high rates of donations by foreign donors is influenced by the need to secure geo-strategic and political interests in recipient countries. Continuous provision of foreign aid to developing countries (such as countries in Sub-Saharan Africa) adversely affects the determination of these countries in enforcing and implementing existing regulations and laws essential for efficient disaster management and recovery. These countries continually rely on the foreign aid and tend to ignore national and local initiatives (Becerra *et al*, 2014). Studies have shown that foreign assistance could hinder governments' ability to implement their own policies, especially in Africa (Brown, 2013; Fisher, 2013).

Implementation of policies in developing nations have always been problematic (Makinde, 2005; Ugwuanyi and Chukwuemeka, 2013). Another key reason why various forms of legislation (disaster legislation included) are difficult to implement in developing countries in Africa, is governments' use of top-down approaches in developing policies. For legislation to be successful in African countries, the target population and communities need to be engaged through participatory methods, in the development of policies using bottom-up approaches. Ignoring the inputs of the target population when developing policies and legislation has created a continuous implementation gap, steming from governments' lack of understanding of the people's needs, and enforced by the inadequacy of such legislation in communities where they are applied (Makinde, 2005). The continued ignorance of governments towards political, social and economic situations in their countries also contribute to difficulties in the implementation of legislation in general (Makinde, 2005; Lawal, 2007). While several countries in Sub-Saharan Africa continually try to develop policies and legislation to ensure sustainable development, the issue of corruption still plague African nations and creates a platform for failed policies. Corruption in government is highlighted in various projects and initiatives introduced by one tenure of governance using national legislation, which tend to become platforms for embezzlement. Such initiatives end up being discarded by the next tenure who introduce their own inititives, creating a cycle that leads to a lack of continuity in important legislation essential for sustainable development in Africa (Otite, 2000; Lawal, 2007; Ajaegbu and Eze, 2010; Egeran, 2011).

2.5: Mitigation and Adaptation for Disaster Risk Reduction:

There is a growing recognition that due to the changing climate, there is a need to understand how adaptation measures aimed at disaster risk reduction would help keep communities safe. There is a link between disaster risk reduction and climate change adaptation, as many hazards that may lead to disasters are usually a direct product of climate change (O'Brien et al, 2008; Iloka, 2016). The changing climate has led to more vulnerability in communities, especially those in Asian and African regions, who lack the essential resources to cope with the impacts of these climate hazards (Shaw et al, 2010; Iloka, 2016). However, conflicting ideas in the the understanding of what constitutes hazards and climate change makes developing a common path for the two concepts difficult (O'Brien et al, 2008). Another issue is the misunderstanding between mitigation and adaptation. Adaptation strategies help communities manage and cope with the impacts brought about by hazards that may have escalated to disasters; mitigation strategies, on the other hand, are actions carried out before disasters occur. These strategies aim to reduce the risk of hazards developing into disasters by advocating for safe and better practices (Smit and Wandel, 2006; Prabhakar et al, 2009). From the time the discourse on the impact of a climate change and the need to tackle its impact became apparent, a key focus has been on reducing the emission of greenhouse gases. At that time though, there were development experts who believed that adaptation measures were best in tackling the impacts of climate change. Such experts were looked upon like people who had given up on the struggle to save the planet. However, after it became obvious that employing mitigation strategies alone would not be enough to tackle the impacts of climate change, development experts had to look towards adaptation strategies (Schipper and Tol, 2005).

From the local community level, up to the international stage, there is a growing need to develop policies to tackle climate risks – policies which could be used on multiple platforms to involve coordinating concerned institutions, stakeholders and developing credible frameworks (Biesbroek et al, 2009). One of the major causes for the increasing number of risks occurring from nature is climate change. The global weather changes various times in a year, from cold to warm weather conditions and vice versa. However, the earth is experiencing the highest level of greenhouse gases ever recorded. As proven by studies carried out on air bubbles found in ice cores, the concentration of CO2 on the planet now is at the highest level in recorded history (Kundzewicz and Matczak, 2012). The line of action that has been taken by governments, development experts and international organisations revolve around mitigation and adaptation strategies. It has been recognised that the causes of climate risks come from man-made and natural sources. Mitigation strategies work towards

ensuring that there is substantial reduction in the sources of risks. It is important to note that mitigation strategies are only effective when there is substantial effort in implementation by concerned stakeholders. On the other hand, adaptation strategies recognise that disaster risks are inevitable, and the best approach is reducing the losses that such disaster risks may cause (Biesbroek et al, 2009; Kundzewicz and Matczak, 2012). Until recently, mitigation and adaptation had been placed at opposing ends in the climate change dialogue. Reducing the impact of global warming was focused on reducing the emission of greenhouse gases (UNFCCC, 2010). As it became obvious that the production of greenhouse gases would continue to grow, there was also a need to develop adaptation strategies for tackling climate change, with the aim of reducing vulnerability. The notion that mitigation and adaptation were two very different approaches made it difficult to think of a possible combination of the two approaches, for some time. This led to two different approaches in dealing with issues that result from climate change (Klein et al, 2007).

However, it was noticed that even though policy makers at the international and country level were developing strategies from mitigation ideas that did not fully work in managing disaster risks, local communities were using approaches made up of a combination of mitigation and adaptation strategies (AMICA, 2008). A synergy of the two approaches has been advocated for better disaster risk reduction practices (Klein et al, 2003; Nyong et al, 2007). While the idea of incorporating mitigation and adaptation strategies for disaster risk reduction is a fairly innovative approach for development experts, local communities in Africa have been using indigenous knowledge, made up of both approaches, in tackling hazards and disasters for generations (Nyong et al, 2007). The changing climate has been attributed as the main cause of large-scale disasters that have occurred (CRED, 2010). Although this assertion may be true, it is important to note that disasters are not just caused only by the elements of the weather – disasters occur when a host of factors and conditions come together to escalate hazards in the environment (Birkmann and von Teichman, 2010). Therefore, the call to understand disaster risk reduction strategies through climate change adaptation (CCA) is on the rise on various platforms (CCD, 2009; IPCC, 2009). The problem remains that while some experts argue that climate change adaptation should be a part of disaster risk reduction (Prabhakar et al, 2009), some others argue that disaster risk reduction is an aspect of climate change adaptation (German Adaptation Strategy to Climate Change, 2008; Birkmann and von Teichman, 2010). There are also no guidelines on how such integration should be carried out (Birkmann and von Teichman, 2010). Development experts tend to develop models that they assume would be applicable and should work in different settings (Iloka, 2016). However, every local community is different from another; there are differences in cultural, legal and behavioural attitudes in communities (Folke, 2006). What works in one community may not work in another, due to factors such as cultural perceptions or a lack of credible data on impacts (Birkmann and von Teichman, 2010).

It is also worth mentioning that disaster risk reduction can have a negative effect on climate change adaptation approaches and vice versa. An example is the use of air-conditioning units for cooling down in the heat (adaptation); but the use of the air-conditioning units also produce energy which causes the warming of the atmosphere (Adger et al, 2005; Kundzewicz and Matczak, 2012). Another example is the disagreement in planning strategies for urban areas. Mitigation approaches suggest construction of buildings with high densities to reduce the reliance on transportation, as a reduction in transportation helps reduce the emission of greenhouse houses. However, adaptation strategies advocate the building of low density houses that ensure green areas within cities are kept green and help in adaptation to heatwaves (Kundzewicz and Matczak, 2012). Humans have continued to be vulnerable to the impacts of climate change. As the threat continues to grow, communities have always found diverse ways to adapt. This has led to an increased interest in adaptation, as the threats of climate change continue to grow (Adger et al, 2003). Developed and industrialised countries have always been the largest contributors to the greenhouse gases that are responsible for changing the climate (Mertz et al, 2009); however, the less developed countries feel the impacts more. Developing nations like those located in Africa, already experience very high temperatures. Any slight variations in the climate that is already hot will lead to more hazards (Christensen et al, 2007). Furthermore, a heavy reliance on agricultural production in developing nations, with low technological and economic

progress increases the vulnerability of communities to climate change in developing countries (Yohe and Tol, 2002). Developed countries are more capable of adapting and being more resilient to the impact of the climate, unlike developing countries. It has been argued that the best way to reduce vulnerability and increase resilience in developing countries is to improve coping capacities (O'Brien et al, 2006).

Mitigation strategies involve the use of short-term investments to tackle the impacts of climate change for the long-term. Adaptation strategies are focused on the use of short-term investments to handle immediate needs, as relates to the impact of climate change, for the short-term (Goklany, 2007). It is generally accepted that short-term actions that make use of mitigation and adaptation strategies are needed for long-term results in managing the impacts of the changing climate. However, there are challenges in the implementation of such actions, one of which is the possibility of using both strategies in a situation where utilising one strategy may lead to a negative outcome for the other (Biesbroek et al, 2009). Another challenge is that while mitigation in tackling the impact of climate change tends to be carried out mostly at the international level, adaptation is usually carried out on the local and national levels (Klein et al, 2007).

2.6: Adaptation, Adaptive Capacity and the link with Vulnerability:

Adaptation is a term that originates from the field of natural sciences. It comes from evolutionary biology, where it explains how animals develop various characteristics over time to adapt to their changing environments (Smit and Wandel, 2006). The term was adapted in the field of anthropology as 'cultural adaptation', where it describes how particular societies adjust to changes in their natural environment by using activities that ensure livelihood (Butzer, 1989; Smit and Wandel, 2006). Adaptation, as it relates to humans, are actions and processes carried out by people, communities, households and countries to enable them cope better with the effects of stressors. These stressors include risks, hazards, disasters or a changing environment (Smit and Wandel, 2006). Adaptation can also be explained as a process where communities apply better methods - which enable them cope with their changing environment - to their culture. It is important to note that such methods that have become a part of culture can only be classified as adaptation if they were developed to deal with stressors (O'Brien and Holland, 1992). Adaptation can occur in various forms. Anticipatory adaptation occurs when planning has been made beforehand while expecting a known stressor to occur. The other type of adaptation is reactive, where the impact of a stressor causes a system (which in this sense may be households, communities or individuals) to adjust for survival. Adaptation could also happen spontaneously, depending on the conditions (Fankhauser et al., 1999; Smit et al., 2000). A system becomes vulnerable when it is exposed and sensitive to stressors, but with more adaptive capacity, such a system becomes less vulnerable. The levels of exposure and sensitivity felt by a system are determined by the environmental, cultural, political and economic conditions that exist in the system. The relationships between these conditions determine the adaptive capacity of such a system (Smit and Wandel, 2006). The adaptive capacity of a system is influenced by a variety of factors such as the availability of funds, the level of managerial skills, access to relevant technologies and information, type of infrastructure, roles of politics and polity, human relations and the adaptation environment itself (Adger et al, 2001; Smit and Pilifosova, 2001; Wisner et al., 2004). Adaptive capacity is different from community to community and from household to household. The ability of a household to cope with stressors like risks is dependent on the community where they live, as well as the environment. For a community, its adaptive capacity is dependent on the available resources it has at its disposal (Yohe and Tol, 2002).

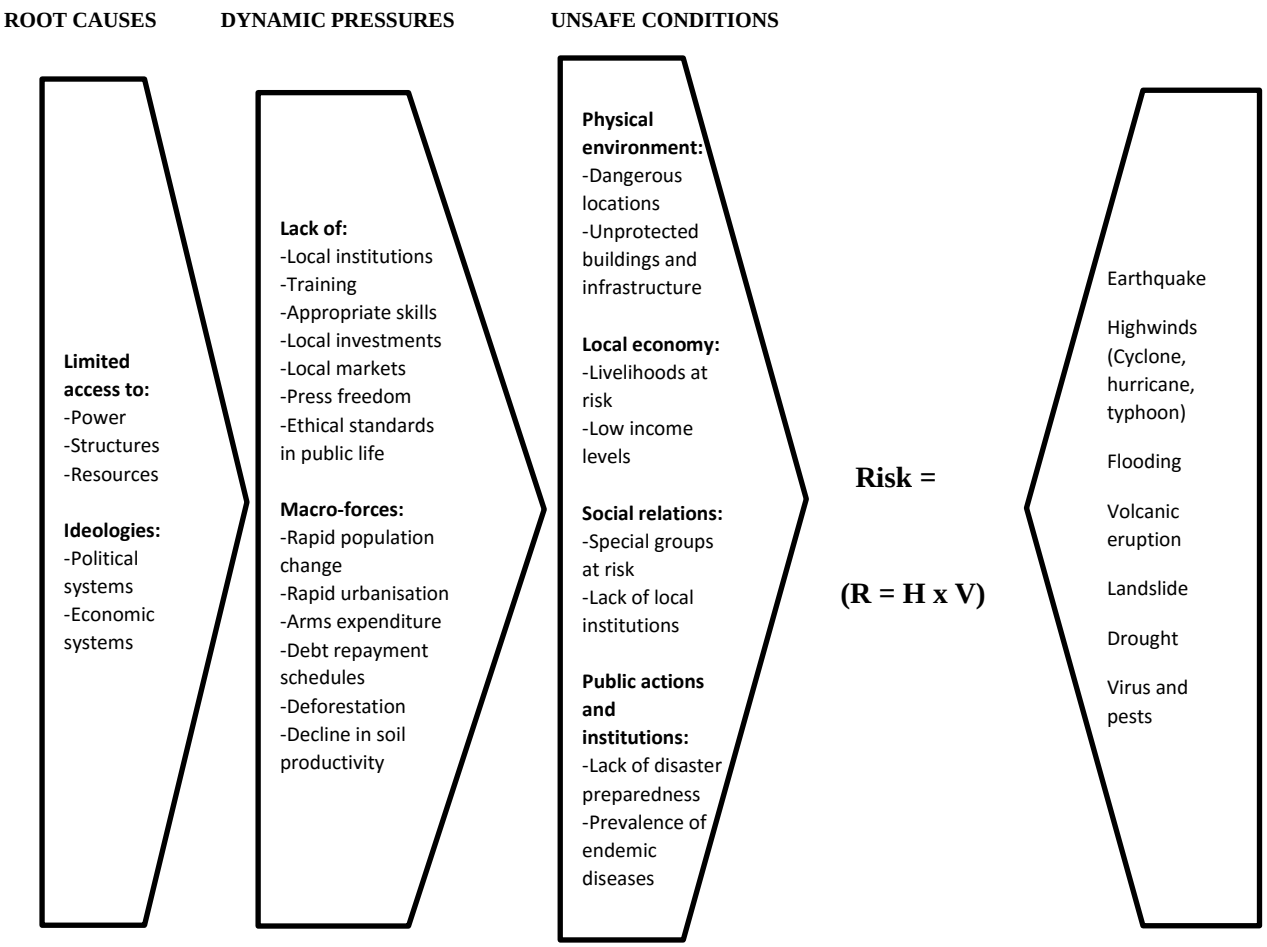
At the community level, it is expected that collective measures aimed at reducing vulnerability and increasing adaptive capacity should exist. These measures help local communities cope with low-impact stressors. However, when such communities are hit with high impact stressors that may be unexpected, they may not be able to adapt. High impact stressors exceed available resources necessary for the adaptation and makes it harder for communities to cope (Kates, 2000; Ford and Smit, 2004; Smit and Wandel, 2006). The range of coping in a system is dependent on changes in the

socio-economic, political and institutional conditions around the system's environment (Folke et al., 2002). A collapse in institutional frameworks, wars and tribal clashes are some of the factors that may lead to lower coping abilities. On the other hand, factors such as improved economic conditions and technological advancements improve the coping range of communities, hence improving adaptive capacity (Folke et al., 2002; Smit and Pilifosova, 2003). Vulnerability and capacity are two terms that have been a hotbed for argument among scholars over time. Some scholars argue that using the term 'vulnerable' to describe people who are exposed to hazards tended to alienate the 'capacity' such people had in making themselves resilient. However, it is generally agreed that when adaptive capacity is high, the level of vulnerability is substantially reduced (Cannon et al, 2003). Vulnerability is variable in various contexts. It is dependent on the surrounding factors that make a system susceptible to stressors. These stressors can be risks and existing hazards in the community. The factors that make communities vulnerable in developing countries and developed countries would be different. For instance, while a community in a developing country might be vulnerable to hazards due to poor income, a community in a developed country could be vulnerable by the ignorance of house builders to land-use policies (Brooks, *et al*., 2005). The income margin, literacy levels, limited access to credible healthcare facilities, the policies of the government and lack of regulations are some of the factors that can increase vulnerability. Such factors can further be grouped as generic or specific factors. Generic factors of vulnerability may include poverty, economic downturn, poor regulations and corruption. Specific factors usually arise from the impact of generic factors – they may include, but may not be limited to the prices of basic commodities (which can be because of economic downturn) and high mortality rates during pregnancy (due to poor regulations and corruption in healthcare) (Brooks *et al.,* 2005).

Generic factors of vulnerability help in understanding vulnerability as it relates to different countries and regions. According to a study by Brooks *et al.,* (2005), countries in sub-Saharan Africa are the most vulnerable to hazards and disasters. Harsh environmental conditions have been shown to lead to conflicts and reduce the ability of such countries to adapt (Barnett, 2005). It is also important to note that communities that face continuous hazards, especially hazards of the environmental kind, tend to have developed adaptive capacities over the years. However, extreme hazards may still tend to overwhelm coping strategies of such communities (Brooks *et al.,* 2005). There is a need to analyse and understand vulnerability of people in communities as it relates to natural hazards. There is a link between poverty and vulnerability to hazards; however, is important to note here that poverty in this context means the condition created by insufficient resources to cushion the impact of hazards. The aim of development work should be to improve livelihoods for vulnerable communities to build a lasting resilience to hazards and disasters (Cannon *et al.,* 2003). The 1970s saw a rise in critical thinking towards understanding the link between human activities, vulnerability and the impact created by disasters. This led to the development of two major frameworks for understanding vulnerability to disasters in the 1980s and 1990s (Twigg, 2001) – the Capacities and Vulnerabilities Analysis (CVA) framework (Anderson and Woodrow, 1989) and Pressure and Release (PAR) models (Blaike *et al.,* 1994). The CVA framework involves using a matrix to find out people's vulnerabilities and capacities. These vulnerabilities and capacities were to be categorised under physical factors (land, skills and labour, finance and healthcare issues), social factors (political systems, informal organisational structures) and motivation factors (personal beliefs, attitudes to one another) (Anderson and Woodrow, 1989; Twigg, 2001). This framework covers a broad range of topics which relates to people, capacities and vulnerabilities in communities. However, it does not cover specific indicators which should be very necessary in looking at livelihoods in communities (Twigg, 2001). However, Adger *et al.,* (2004) developed specific indicators of vulnerability that could be applied at the community level and might make this framework more reliable. Such indicators include level of economic well-being, health and nutrition, physical infrastructure, education, governance and social capital, level of dependence on agriculture, demography and location, natural resources and technological advancements (Adger *et al.,* 2004).

The PAR Model was developed by Blaike *et al.*, (1994) to understand vulnerability to natural hazards. The PAR is based on the notion that human processes lead to vulnerability when there is exposure to hazards. As shown in the PAR Model in Fig. 2.1, to understand vulnerability, it is essential to look at the root causes or underlying issues that generate the vulnerability, the pressures that make the root causes more prominent and conditions which make people vulnerable to hazards and disasters (Wisner *et al.*, 2004). The PAR Model captures the essence of vulnerability, while trying to understand several types of hazards and livelihoods. However, the flaw of this model is that it cannot be used for measuring vulnerability and is only focused on explaining the term (Twigg, 2001). Both models look at the role of livelihood assets as an aspect in the vulnerability and adaptive capacities discussion. The Sustainable Livelihoods Approach (SLA) makes the livelihoods of people the crux from which the concepts of vulnerability, adaptation and adaptive capacities are developed (Twigg, 2001). The PAR tries to link the factors which cause vulnerability to impact of hazards for individuals and communities (Wisner et al., 2004). The model is based on three processes that connect disasters – root causes, dynamic pressures and unsafe conditions. Root causes are the processes which determine economic, social, political, legal and demographic structures within a community. They reflect how power is balanced within the society, raising questions on marginalisation of people (Wisner et al, 2004). It has been argued that people who live in communities with low economic growth and less environmental developments are usually marginalised by the people in power (Wisner, 1976; Wisner, 1980). This marginalisation leads to lack of livelihoods assets and resources for managing vulnerability. Such marginalised people may even lose their confidence in utilising their indigenous knowledge (Wisner et al, 2004). Dynamic pressures arise from the root causes. They create conditions that are inappropriate and tend to highlight the impact of the root causes; for instance, conflicts, deforestation and lack of adequate institutions. This leads to unsafe conditions, which is the expression of the vulnerability of people to various hazards. Unsafe conditions may include low incomes, inadequate employment and unsafe settlements (Wisner et al, 2004).

Figure 2.1: The Pressure and Release (PAR) Model



Source: Wisner *et al*, 2004

The PAR Model is very important in helping communities define what they consider as vulnerabilities in their daily lives. The model has been used to involve local people in environmental assessment and other issues (Levin and Weiner, 1997). However, the model has its limitations. It should be noted that socio-economic conditions which create vulnerablility in communities are influenced by hazards. The model fails to link hazards and these conditions which create vulnerability. It also fails to analyse the interactions between the environment and society (Wisner *et al*, 2004; Yasir, 2009).

While the use of various approaches in trying to understand vulnerability and work towards disaster risk reduction in communities has been successful in some areas, there are still issues with every approach used. Although disaster management experts and researchers tend to believe that their approaches to vulnerability reduction and disaster risk reduction make use of the same parameters, there are some major differences in their approaches. The social science perspective and interest in disaster began in the mid-20th century, when the government of the USA were trying to understand the impact of war on the people of the nation (Quarantelli, 1988). This led to the development and evolution of the various approaches to disaster. Contributions from experts in the field of geography who viewed disasters from an 'ecological thinking' perspective, created the socio-environmentalist approach to disasters that has been relevant in the applied sciences (Mileti, 1999). This school of thought believed that natural hazards are not disasters and that man should seek ways to adapt and

adjust to his environment when there is a threat of disasters. Such ideology gave rise to development experts and researchers developing various concepts for vulnerability (Cardona, 2003). The field of natural sciences favour the term 'natural disasters' with the notion that events like earthquakes, hurricanes or floods are 'disasters'. Some meteorological and hydrological experts even suggest that because events such as these cannot be accurately predicted, there is nothing that can be done to avoid the disaster. The perception from the field of natural sciences has been termed the biggest influence on the UN's declaration of the 1990s as the International Decade for Natural Disaster Reduction (Cardona, 2003). Such disagreements in approaches, although good for influencing continuous research in the field of mitigation and adaptation to disasters, would also make it difficult for experts to arrive at a common approach for disaster management.

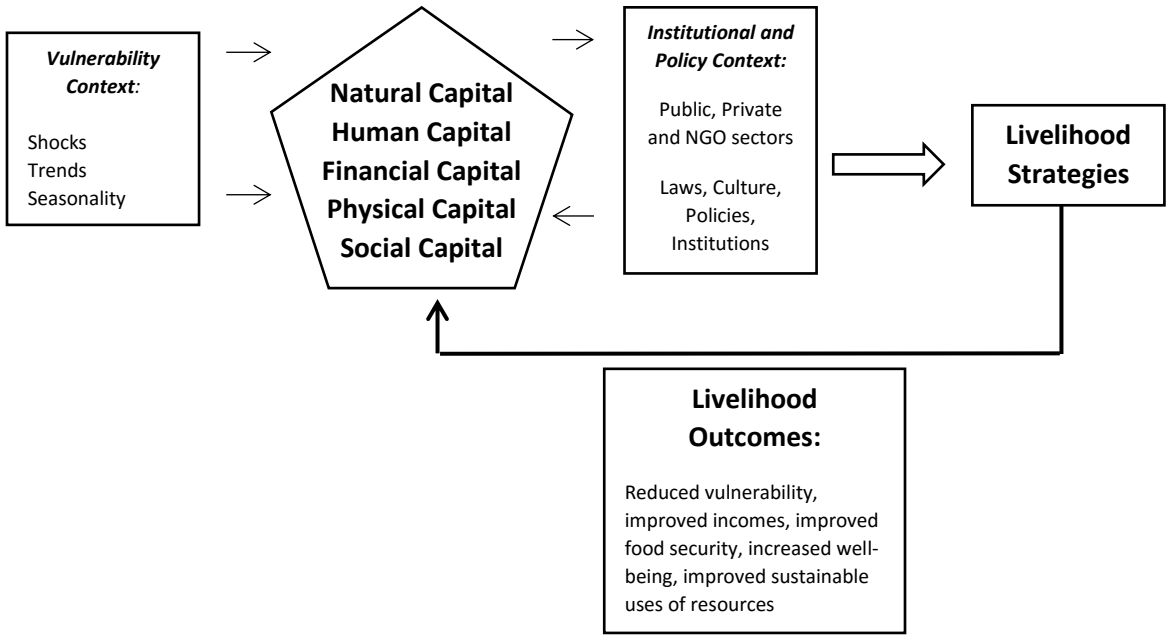
2.7: The Sustainable Livelihoods Approach:

In the past, the management of disasters tended to focus on how to manage the outcome of disasters on communities. Disaster management efforts were focused on assisting the affected members of community with their immediate needs after disaster. Although such assistance went a long way to help people recover, it did not help in any way towards the building of resilience to future shocks. A lack of investment in vulnerability reduction increases the possibility of future disaster risks and reduces the coping capacities of the community (Blaikie *et al.*, 1994; UNISDR, 2004, Alexander, 2006). Understanding the importance of disaster mitigation and the need for adaptation due to the changing climate (Bedsworth and Hanak, 2010) has enabled development experts to highlight the importance of considering the capacities of communities in disaster management and development processes. Through participatory approaches, communities can build up and use their own capacities to reduce vulnerability during shocks (UNISDR, 2004; Alexander et al, 2006). Building up community capacities not only help in the event of a disaster; these capacities help boost the assets that enable members of the community attain sustainable livelihoods (Twigg, 2004). It has been argued that the aim of community development policies should be to ensure that livelihoods are built up to make members of the community more resilient to hazards and disasters. By doing so, members of the community become more protected from the impacts of hazards and disasters. The first steps in protecting members of the community from hazards and disasters involves strengthening several aspects of their wellbeing and proper access to social protection – social protection which includes, but is not limited to protection provided by the government and related institutions (Cannon *et al.*, 2003).

The core factor which makes disasters occur is the vulnerability to hazards; disaster risk is a product of a specific type of hazard and the vulnerability of the individuals or community that will be affected (Vatsa, 2004). An individual or a community is said to be vulnerable if there is a possibility that an event or occurrence will lead to 'a level of wellbeing which is below a socially accepted threshold' (Glewwe and Hall, 1998). Vulnerability is associated with changes in socio-economic status and is highlighted as a failure to handle risks, shocks and stress. The households that make up communities manage and resist these risks, shocks and stress by building up assets that help reduce vulnerability. Therefore, for disaster risk reduction to be sustainable there is a need to put asset-building at its core (Vatsa, 2004). More assets mean individuals are less vulnerable to disasters (Moser, 1997). Assets are the general wealth in a household. This wealth can be palpable like skills, lands and buildings and can also be impalpable such as meaningful relationships and health (Vatsa, 2004). There have been continuous efforts to develop strategies aimed at sustaining development in developing countries around the world. Such efforts have involved the use of several types of frameworks, which have led to some success and failure stories. The failures experienced by some of these frameworks are usually due to more focus on the causes of poverty and hindered growth, while limiting focus on the adaptive capacities and livelihoods that have made local communities survive over time. However, in 1994, an approach that covered various themes as relates to the poor and people in developing countries was introduced (Helmore and Singh, 2001). The Sustainable Livelihoods Approach (SLA) was introduced by the DFID in Britain in 1999, although Chambers and Conway (1992) had earlier defined the term

in their work (Mazibuko, 2013). The SLA is a guideline that shows how to view developmental work to focus on the core issues that exist at community level. Its aim is to put together all the important aspects in the community that are necessary for sustainable development (Helmore and Singh, 2001; Mazibuko, 2013). Livelihoods are comprised of resources that help in the enhancement of living conditions of people in the society. Livelihoods are made up of assets, capabilities and actions that are aimed towards better living (Twigg, 2004; Serrat, 2008). As shown in Figure 2.2, these livelihood assets come together to transform structures and processes to yield beneficial livelihood outcomes.

Figure 2.2: The Sustainable Livelihood Framework



Source: Adapted from DFID (2000) *Sustainable Livelihood Framework*

The sustainable livelihood approach tries to understand policies and institutions that determine how the vulnerable and poor in communities live. It focuses on the creation of development activities that is participatory and responsive for the people in communities, while also aiming to be sustainable (Serrat, 2008). The SLA recognises that members of the community have various assets and capacities that help them in sustaining daily life. The SLA is based on the strengths of people – it tries to understand how things should be done based on the assets available to members of the community. The approach works with the notion that development begins with the utilization of the assets already available to communities and understanding how these assets should help the communities achieve even better levels of development (Mazibuko, 2013). The poor in communities have a higher risk of being more vulnerable to the effects of hazards and disasters. Although this is not an absolute hypothesis, the poor are usually more vulnerable in the sense that they tend to lack the coping power and resources which are essential to adapt and recover from the impact of disasters. In this vein, it follows that developmental work that is aimed at reducing poverty in communities indirectly enhances adaptability and reduces vulnerability to the outcome of disasters (Cannon *et al.*, 2003). The SLA is established on various notions around the links between poverty, vulnerability and sustainable development. Poverty is not just a lack of income or money; it can also be the lack of social and health services. The poor know what is lacking in their lives and know what makes them vulnerable in the face of hazards and disasters. Therefore, there is a need for the poor and vulnerable to be involved in the planning of sustainable development policies in communities (Krantz, 2001). The SLA brings together various assets that determine livelihoods within the community (Table 2.1). These assets may

lead to improved livelihoods or diminished livelihoods – it depends on level of availability or non-availability of such assets within households in the community. The different households that make up a community require several types of assets; however, assets available to households in the community fall under five major groups. They are physical assets, social assets, natural assets, human assets and financial assets. These assets are defined by the range of factors that they cover (Serrat, 2008).

Table 2.1: Assets for Sustainable Livelihoods

Physical Assets	**Social Assets**	**Natural Assets**	**Human Assets**	**Financial Assets**
Roads	Kinsmen	Land	Education	Wages
Transportation	Neighbours	Water resources	Health	Salaries
Vehicles	Relationships	Wildlife	Skills	Pension
Buildings	Networks	Trees	Nutrition	Savings
Technology	Communal values	Biodiversity	Adaptive capacity	
Water supply	Shared values			
Energy				

Source: Department for International Development (DFID, UK)

The SLA allows development experts to depart from normal approaches used for identifying the issues that increase vulnerability in communities. The experts can review all aspects of community living, as it relates to the vulnerable. This enables access to all factors that are important to members of the community (Serrat, 2008). The approach stresses the importance of understanding all the factors that affect community life and assets that are necessary for sustaining livelihoods. The approach also tries to link these assets into institutional framework for tackling vulnerability and poverty. It helps to deliver outcomes such as better livelihoods, improved wellbeing, more income, reduced vulnerability to hazards and disasters, improved food availability and sustainability (Krantz, 2001; Serrat, 2008). However, this approach has some weaknesses as well. It does not show any methods for identifying the 'poor' and 'vulnerable' in the community. There is no criteria identifying who should qualify as 'poor' or 'vulnerable' (Serrat, 2008) and there are no specified ways of measuring assets (DFID, 2000). The approach also fails to recognise the impact factors such as social status, governance and power have in community life (Krantz, 2001; Serrat, 2008). The SLA could easily be misused in various contexts as well. Measuring assets involves viewing such assets from the vulnerability perspective. In this context, the SLA tries to highlight what is needed by vulnerable and poor households. In measuring assets, there is a need to understand existing guiding policies that determine how assets are distributed across various households and how such households utilise these assets (Collins, 2002). A failure to recognise SLA in this broader context may lead to imbalances – an example of such imbalances being that enhanced livelihood for one household may lead to a loss of livelihood for another household (Collins, 2002; Serrat, 2008).

2.8: Social Protection and DRR:

The unpredictable changing climate has become a challenge for development experts. This has led to a shift from providing aids and relief in the event of disasters, to protecting communities that are vulnerable by reducing disaster risks (Davis *et al*., 2009). The 1980s and 1990s saw the rise in the interest on the concept of social protection. It was used to describe the use of safety nets to help people in need. However, over the years, the term has evolved to also include actions carried out to ensure community development, poverty eradication (Devereux and Sabates-Wheeler, 2004; Barrientos and Hulme, 2008) and sustainable livelihoods (Tanner and Mitchell, 2008; Davis *et al*., 2009). The issue of sustaining livelihoods has become a concern in development research. To sustain livelihoods, it is necessary to provide social protection for members of communities. However, factors such as lack of political will, inadequate monetary policies and management issues combine to ensure that social protection, which helps communities bounce back from the impacts of disasters especially in developing countries, is absent (Devereux, 2001). Social protection involves strategies which are employed to assist members of communities and households better manage risks and hazards. This protection keeps members of the community safe and help the poor get back on their feet if they are affected by the impacts of hazards and disasters. Social protection ensures that members of the community, especially the poor and vulnerable, get access to basic amenities. It protects the poor in communities from present and future shocks (Holzmann and Jorgensen, 2001; Davies *et al.*, 2009). Growing evidence shows that social protection aids poverty reduction and sustainable livelihoods. This has made it an important theme in work focused on sustainable development (Davies *et al.*, 2009; Davies *et al.*, 2013). It is widely accepted that a necessary starting point for tackling the vulnerability of households to shocks and reducing poverty, especially in developing countries, is by investing in social protection (Devereux and White, 2010; Dercon, 2011). Disaster risk reduction and social protection are intertwined. In agriculture, social protection is one of the key DRR strategies used to reduce food shortages. Other strategies include environmental management, early warning systems, infrastructure development and risk assessment (Davies *et al.*, 2009).

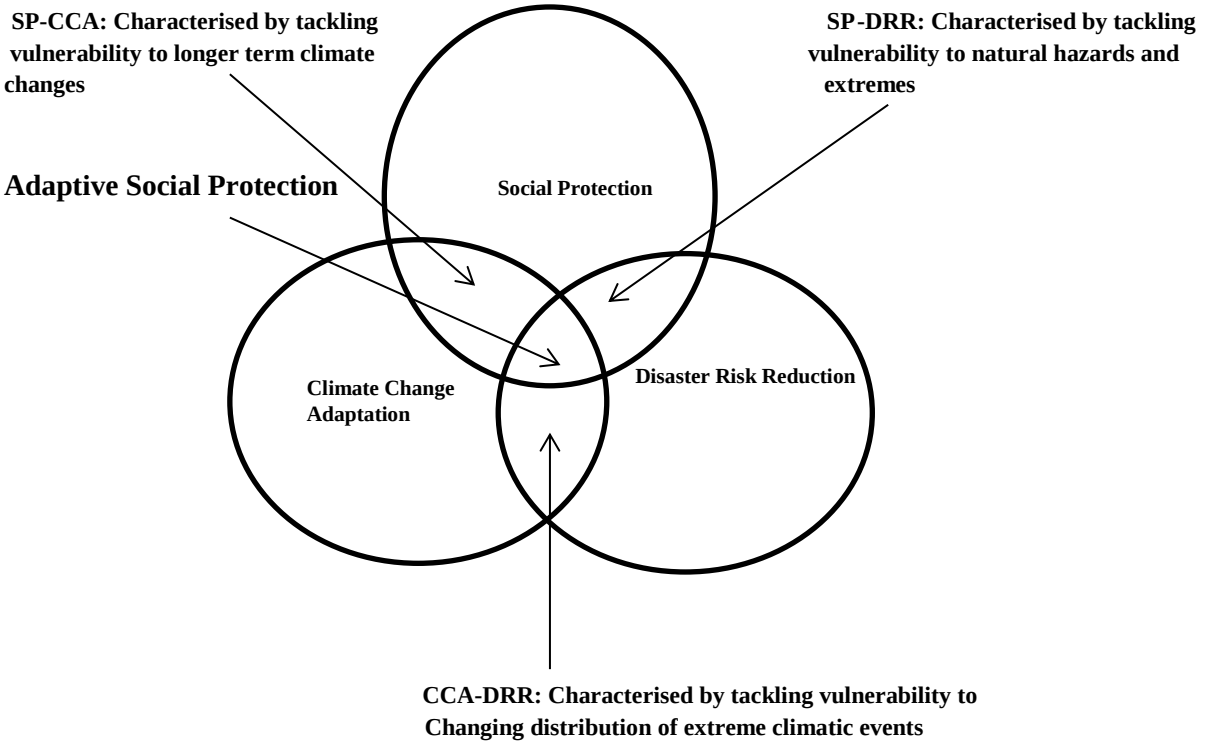
The growing concerns about the dangers created by climate change have led stakeholders to seek measures to ensure sustainable development across the planet. There is increased vigour from development experts searching for strategies that would help reduce poverty and attain MDGs (Millennium Development Goals). To tackle the increased frequency of disasters emanating from climate change, social protection, CCA and DRR strategies are needed, to sustain development, strengthen livelihoods and build resilience to shocks and stresses (Davies *et al.*, 2009). At local level, there is a reliance on agricultural products that are grown within the community. Communities in developing nations depend on food from their communities for survival. However, shocks and stresses such as floods affect the livelihoods and wellbeing of the members of these communities. This is made worse by the impact of the changing climate that is a determining factor in how often and how frequent the impact of such shocks and stresses affect individuals. Apart from measures carried out to reduce disaster risks, social protection approaches are needed to ensure sustainability and build resilience in local communities (Davis *et al.*, 2009). Disaster risk reduction (DRR), social protection (SP) and climate change adaptation (CCA) all work towards building the resilience of the vulnerable to the impacts of hazards and disasters, while aiming to sustain livelihoods. All three of them were developed to help communities cope with uncertainties that may arise from hazards. However, it is important to note that although all three fields have these similarities, they have been studied as separate bodies of knowledge (DFID, 2007; Davis *et al.*, 2009; Davies *et al.*, 2013). There is a need for these three fields to be studied and used in development strategies together, as it has been argued that using each field individually may lead to failed vulnerability reduction interventions (Bayer, 2008; Shepherd, 2008). For developing countries especially, a strategy that makes use of concepts from all three fields could save costs and prevent overlapping of strategies (Davies *et al.*, 2013). There have been various calls for these three fields to be merged into one large field. A review by Stern (2009) highlighted that there is an increase in the number of disasters originating from natural hazards and the changing climate. The review called for a broader approach towards sustainable development that should include all aspects of development strategies. It has also been argued that social protection, together with disaster risk management, should be at the forefront of adaptation for

development (Stern, 2009). The UN Human Development Report (2007/2008) took this further by suggesting that CCA should be a core component of international frameworks and strategies aimed at poverty reduction, disaster reduction and recovery (UNISDR, 2008). Social policy interventions by the World Bank in Asia, after disasters from natural hazards, have shown that social protection can help reduce vulnerability (Heltberg *et al.,* 2009). Other international agencies and organisations are beginning to work towards understanding the links between social protection, CCA and DRR for better development strategies (Davies *et al.,* 2013). A more recent concept known as Adaptive Social Protection (ASP) which integrates elements of social protection, DRR and CCA has been advocated. The Adaptive Social Protection (ASP) works on the premise that to improve the welfare and livelihoods of the poor and vulnerable, there is a need to tackle the factors which cause vulnerability. This enables adaptation to the impacts of the changing climate. For this to be attained, social protection, CCA and DRR strategies must be combined in tackling the root causes of vulnerability. Under ASP, vulnerability is not just a product of hazards and risks; it includes failure in institutions and social elements (Davies *et al.,* 2013). The ASP is an approach that derives its concepts from the Sustainable Livelihood Framework (Scoones, 1998; Davies *et al.,* 2013). Three links in strategies help form the basis for the ASP:

1. social protection and CCA strategies for tackling vulnerability to the impact of current and future climate change conditions,
2. social protection and DRR strategies for tackling vulnerability to natural hazards and disasters,
3. CCA and DRR strategies for tackling vulnerability to the changing distribution of climatic conditions that result in disaster (Davies *et al.,* 2009; Davies *et al.,* 2013).

As seen in Figure 2.3, these three sets of relationships come together in equal proportions to ensure the success of the adaptive social protection model as a tool for reducing vulnerability and promoting livelihoods.

Figure 2.3: Adaptive Social Protection (ASP)



Source: Davies et al, 2013

This concept has been used to successfully tackle vulnerability in various regions in Asia and if development experts would invest more in it, it would go a long way in building programs that would reduce vulnerability, improve adaptation and sustain livelihoods across the globe (Davies *et al.*, 2013).

2.9: The Influence of Faith, Religion and Beliefs in Hazards and Disasters:

Disasters that are products of natural hazards have been on the rise since the start of the 20th century and the 21st century saw the damages caused by such hazards escalating (CRED, 2008). Whenever disasters occur, there is always the tendency of the press to capture the religious perceptions of the affected victims. Disasters are becoming less frequently looked upon as an 'act of God' and more frequently seen to as a product of vulnerability to hazards (O'Keefe *et al.*, 1976; Wisner *et al*., 2004). However, some people still see disasters as 'acts of God' (Gaillard and Texier, 2010). In various regions of the world affected by disasters, religion is part of people's cultural identity and should be duly considered in the disaster management process (Chester, 2005). Disasters have been shown to affect people not just physically, but psychologically as well. Post-traumatic stress disorder (PTSD) and depression are a few of the conditions which could emanate from the impact or aftermath of disasters. At the extreme, studies have shown that people who have experienced great losses in disasters may develop suicidal tendencies (Vehid *et al*, 2006; Kessler *et al.*, 2006; Rezaein, 2008). Interestingly, it has been shown that people who rely on religion and religious beliefs become less depressed and tend to harbour less suicidal thoughts (Moreira-Almeida *et al.*, 2006). From the early days of man's existence, religion and faith have always played vital roles in the lives of people trying to deal with disasters (Chester and Duncan, 2008; Wisner *et al*., 2012). People's beliefs shape how disasters are handled in local communities. Some indigenous groups in the Sudan and Eastern Africa believe that the dead cause earthquakes while rumbling in the underworld; in Central Mongolia, some people believe a dragon lives in their local volcano and spews out fire. Beliefs such as this stem from oral histories that have been passed down through generations and are very relevant to indigenous knowledge systems (Wisner *et al*., 2012). From a religious perspective, humans have understood disasters as punishment from a Supreme Being or as an act of purification of the earth by the Supreme Being. This perception is widely represented in Christianity and Islam. The Holy Bible talks about God's role in flooding the earth after the people would not repent of their sins (Wisner *et al.*, 2012) and the Holy Qu'ran highlights Allah's role in plagues and earthquakes which affected the world (Akasoy, 2009). These holy books form the foundations of Christianity and Islam respectively; followers of these religions might have religious interpretations of disaster in their daily lives, with reference to the stories in the holy books. Disasters have been known to have adverse effects on people's behaviours and attitudes, as well as on their spiritual and physical outlook to life (Roberts and Ashley, 2008).

Disaster survivors try to understand the reasons why they suffered the losses they have suffered and the challenges they face in rebuilding their lives could cause a breakdown in the health of such survivors (Cook *et al*., 2013). It is known that disaster survivors tend to turn to religion and faith as a form of solace (Koenig, 2006). In a national survey carried out by the United States government after the 9/11 terrorist attacks, the result showed that around 90 percent of the individuals who partook in the survey said that their faith and religion helped them cope with the outcome of the attack (Schuster *et al.*, 2001). Studies have shown that having a religious belief has helped individuals affected by disaster to experience lower levels of stress and ill health, while improving such individuals' spiritual growth and confidence (Fischer *et al.*, 2010). However, it is important to note that disasters also put a strain on people's religious beliefs and faith, leading to diminished health and mental strength. This strain could cause people to question God on why He allowed the disaster to befall them or why God allowed them to be punished (Exline *et al.*, 2011). The term, 'theodicy', coined by German philosopher, Gottfried Wilhelm Leibniz in 1710, has been used when trying to understand the way God works in relation to human suffering. Philosophers and biblical authors have also tried to come to term with how the suffering of the world can be understood when there is a loving God. Theodicy has

always been understood from two perceptions. The 'free will' perception to theodicy is the belief that since humans are 'free' in the world, then the suffering caused by disasters on humans are because of free will and the sins of humans, leading to punishment from God (Wisner *et al.*, 2012). The second perception to theodicy is the 'best of all possible worlds' ideology, which argues that nature is created with hazards that can lead to harm, but that disasters that occur are used by God for a better purpose (Murphy, 2005; Chester and Duncan, 2009). Events in the past such as the Lisbon earthquake of 1755 and the atrocities of the First and Second World Wars caused philosophers to disagree on this notion of theodicy. The disagreement was on why there is a God that allows suffering to happen or why there are evil people seeking to destroy the world (Chester, 2001; Chester, 2005). For the common people in communities, the notion of God in relation to disasters is a very important one. In areas affected by volcanic eruptions, people have been known to view the devastation caused by the eruptions as punishment from God for the sins of man (Chester, 2005).

Such perceptions are not limited to past generations, as even communities and individuals in developed countries believe in this. The eruption of Mount St. Helens in the USA in 1980 led an evangelist to say that he believed that the eruption was a result of God's anger towards the consumption of hard liquor (Blong, 1984). In the twentieth century, religious relics were paraded at eruption sites in Sicily and the twenty-first century saw religious leaders commanding eruption craters to close (Blong, 1984; Chester, 2005). During devastating floods in West Virginia, USA, members of the clergy tried to assure people of God's love in the face of the disaster while quashing the idea that floods were vengeance from God (Bradfield *et al.*, 1989). Islam, which literally means submission, views suffering as a method used by God to bring people back to the teaching of the Prophet (Anon, 1997). What these examples show are different approaches to theodicy and disasters. While such approaches to the notion of disasters are very significant to people, hazards and disasters' experts agree that disasters are a product of the vulnerability caused by imbalances in wealth and access to resources, as well as power and regional factors (Alexander, 2000). However, how people interpret disasters should be generally respected and accepted as a pathway for understanding local cultures (Chester, 2005). There has always been a link between humans, God and nature; this link is very prevalent when it comes to the issue of hazards and disasters. Trying to understand hazards from a social perspective is an important entry point for preparing and managing disasters, as well as in providing relief in the aftermath of disasters (Bankoff, 2004). Individual beliefs are formed on a cultural base, which is linked to spiritual and social approaches to life issues (San-Juan, 2013). However, there is a tendency for hazard and disaster management experts, to pass off as insignificant, the actions taken by people in communities usually influenced by their cultural perspectives (Bankoff, 2004; San-Juan and Ortego, 2000). While development experts may not understand the views of the local people, it is important to respect them. After an earthquake that affected a local community in Bolivia in 1998, the members of the community considered the earthquake to be caused by their behaviours and actions which angered Mother Earth. Only after a major reconciliation ritual was carried out to appease Mother Earth did the locals come together and use personal resources to rebuild their community (San-Juan and Ortego, 2000). Although such beliefs may seem irrational to disaster management and relief experts, it is important to note that such actions are very important to the local people; to the local people, those beliefs and actions represent the starting point in the recovery process (Bankoff, 2004).

2.10: The Role of Indigenous Knowledge in DRR:

Research into development in local communities has found that use is made of technological and scientific fixes to solve problems. However, it is increasingly recognised that communities have always developed their own ways of dealing with problems using traditional knowledge. Local communities have always found methods of adapting to the impacts from hazards and disasters. Such methods of adaptation had been passed down from generation to generation, long before scientific methods for tackling hazards and disasters were conceived (Gaillard & Mercer 2012). To effectively aid such local communities, there is a need to understand this traditional knowledge and systems of management (Atte, 1992). Indigenous knowledge has evolved over the years into two distinct aspects. The two broad aspects are academic and indigenous knowledge focused on development (Howes and Chambers, 1980). The academic aspect covers the fields of ethnoscience and human ecology while the development-focused aspect of indigenous knowledge covers farming systems and participatory development (Sillitoe, 1998). Indigenous knowledge in the context of disaster risk reduction has been defined by Shaw *et al* (2008) as the core of local coping strategies which have been applied by communities and which has enabled such communities survive disasters for generations. It is the specific knowledge available to a people or community which has been developed over long periods. This knowledge would have been tested time and time again across generations and this would have proved the reliability such that it could be adopted into the culture and environment of the people or community (IIRR, 1996). Coping strategies have always been used by local communities to ensure disaster risk reduction for many years. These strategies come from local knowledge that has been passed down through generations (Wisner, *et al.*, 2012). Studies that are carried out to understand indigenous knowledge are quite challenging, which is a result of differences in cultural understanding and well as political situations of different communities (Sillitoe, 1998). However, indigenous knowledge is very important for disaster risk reduction. It backs the bottom-up approach to disaster management, where community practices form the core of disaster management policies. It also enables the development of safety culture and creates a base for community resilience. This greatly minimises underlying risks and strengthens local disaster preparedness (Shaw *et al.*, 2009).

Indigenous knowledge is valuable local knowledge which has helped local people manage disasters for generations. It has been described in various contexts as local knowledge and traditional knowledge, but they all mean the same thing (Kelman *et al.*, 2012). Indigenous knowledge has continued to get more attention in disaster management. This recognition started fully in the early 90s and has continued to grow (Mercer *et al.*, 2010; Hiwasaki *et al.*, 2014). It is acknowledged that this knowledge has the potential for improving disaster risk reduction policies on different platforms, as has been shown in disaster management in the Asia-Pacific region (Shaw *et al.*, 2008). It has even been argued that strategies aimed at developing local communities cannot be complete without the recognition of indigenous knowledge (Nyong *et al.*, 2007). Indigenous knowledge plays a significant role in empowering local people towards becoming champions of disaster risk reduction strategies. Local people use indigenous knowledge to carry out activities that lead to community development (Mwaura, 2008). Indigenous knowledge provides local communities with ideas for tackling local problems and helps in their developmental processes. Such knowledge sustains the local communities and helps strengthen their cultural identity (Jabulani, 2007). Indigenous practices such as mixed cropping help keep soil fertile throughout a farming year. Mixed cropping is a planting method that allows local farmers to plant several types of crops on a portion of land. This method of farming has many advantages for local farmers. Due to the lack of available land for cultivation, a parcel of land could serve all the agricultural purposes for a local household (Mwaura, 2008). Planting crops like beans together with cassava or yams helps in sustaining the fertility of soil and helps to control weeds. Mixed cropping also helps to ensure that there is a lower chance of famine and malnutrition in local households as different crops with different nutritional values are available for consumption (Mwaura 2008). Although such continuous cropping may weaken the integrity of the soil, local farmers in Africa would ensure that tilling is done a very few times throughout the year to ensure that top soil is not washed away by floods (Domfeh 2007; Mwaura 2008). Crops are not only cultivated for food; some crops are cultivated mainly for tackling hazards using local knowledge. Various local communities in Nigeria plant bamboo plants and raffia palms that prevent the washing away of soil.

Bamboo plants are very effective in controlling soil and gully erosions (Abam, 1993; Zhou *et al.*, 2005). Local communities in Swaziland in South Africa determine the beginning of the rainy season by observing the various species of birds that arrive in their communities and the height on which the birds build their nests helps in predicting if floods should be expected (Domfeh, 2007). The use of indigenous knowledge is not limited to Africa. Indigenous knowledge has saved lives in other parts of the world as can be observed in how it helped the Moken community who live on the Asian coastline survive the tsunami of 2004. By observing a change in the sea level, even without a change in weather, the local communities could move to safer areas before the tsunami hit (Arunotai, 2008).

Local communities are champions of indigenous knowledge. This knowledge has empowered communities to make use of local technological approaches in various contexts for their development (Tharakan, 2015). Local technology has continued to enable individuals in local communities take care of themselves, their families and support their livelihoods daily. Local technology can range from the use of trees in local communities to cure ailments and diseases to advanced procedures like acupuncture (Mwaura 2008; Tharakan 2015). Local technological approaches can be categorised into two: soft and hard technologies. Soft technology allows local communities to use basic local methods to tackle issues in the community. They are community-led disaster risk reduction (DRR) approaches that are critical to disaster management at the community level (Abam 1993; Domfeh 2007). This type of technology utilises local laws and experiences to alter nature, to ensure adaptation and promote human development. Hard technology is focused on the application of knowledge derived from natural science that can be adjusted into managing issues related to human development at a global level (Zhouying 2005, Iloka, 2016). Hard technology has its roots in soft technology (Bessant & Francis 2005; Zhouying 2005). Soft technology in local communities can include the knowledge of local weather patterns; the utilisation of local herbs for production of drugs that can be consumed worldwide is a form of hard technology (Domfeh, 2007; Eyong, 2007). Over the years, the relevance of indigenous knowledge in relation to hazards and disasters in the environment has been captured by various individuals (Cronin *et al.*, 2004; Dekens, 2007). However, there is little recognition for the importance of this indigenous knowledge in various countries, which has led to a reduction in practical application of such knowledge and little use of the knowledge within local communities. This situation is prevalent even as there is global recognition that indigenous knowledge is an important aspect of vulnerability and disasters management (Dekens, 2007). The problem is that development experts in developing nations tend to ignore local knowledge, preferring to use scientific knowledge in disaster risk reduction. This is due to the wrong assumption in some quarters that indigenous knowledge is inferior to scientific knowledge (Mercer *et al*., 2010), an assumption that comes from ignorance and ideologies (Ocholla and Onyancha, 2005). These experts tend to forget the value of indigenous knowledge in creating good policies for local communities, as indigenous knowledge is the knowledge of the people (Gaillard and Mercer 2012; Rist & Dahdouh-Guebas 2006). Local knowledge passed down through generations has sustained communities and helped them survive the impacts of hazards and disasters (Gaillard and Mercer, 2012).

This knowledge has been gathered by ancestors who have experienced and recovered from the impacts of hazards and disasters, who then pass the knowledge down to their children. The generational flow of knowledge continues to provide a learning platform for DRR adaptation strategies and sustainability in communities (Eyong, 2007). Despite the importance of indigenous knowledge for sustainable development in communities, development experts and stakeholders tend to ignore this knowledge, preferring to use scientific knowledge in projects at community level. This has led to failed and unsustainable projects in communities. While scientific knowledge makes use of fixed strategies for hazards and disasters management which may work in one community but not in another, indigenous knowledge makes use of indigenous strategies, developed and specific to a community (Wisner *et al.*, 2012). The implementation of only this policy-based/scientific knowledge to disaster management has seen countries working towards disasters' relief while totally ignoring the reduction of disaster risks (Shaw, 2009). This policy-based approach relies on scientific knowledge or 'western' knowledge. Although scientific knowledge has been successfully applied in disaster risk reduction, it has been noted that ignoring local knowledge for 'western' knowledge has led to

vulnerability in some communities. For example, in Bangladesh, the roofing of houses using local materials obtained from the bush has been abandoned and people now tend to use corrugated iron instead. They have come to believe this is 'Westernization' and trendy and a sign of wealth. However, this has increased vulnerability. As Bangladesh is a cyclone-prone country, use of local materials that are not heavy and easily replaceable ensures that there is a continuous resilience in the event of disasters. Corrugated iron, on the other hand, is heavy, difficult to replace and is a deadly hazard that can cause fatalities when ripped off in the event of a cyclone (Wisner *et al.*, 2012). It has been argued that local people should be given a chance to determine their own destinies, by being allowed to continue with their local methods of adaptation that have helped them survive for generations (Sillitoe and Marzano, 2008). The use of scientific knowledge to tackle disasters, especially in Africa, tends to make indigenous knowledge champions in communities feel irrelevant. However, if governments should show more interest in indigenous knowledge and recognise its value to disaster risk reduction, it would lead to better policies for disaster risk reduction (Iloka, 2016).

While it has been advocated that recognising the importance of indigenous knowledge is a starting point for disaster risk reduction (Dekens, 2007), there are challenges in implementing indigenous knowledge. Indigenous knowledge in Africa is passed down through generations by the telling of stories to the younger generation. The younger generation also learn about indigenous knowledge by observing activities carried out the elders in their communities. However, as younger people have become more attracted to the 'modern' ways of life, there is lack of interest in the 'older' ways of life. Most youth in communities tend to associate indigenous knowledge as being the knowledge of the old and poor (Kgomotso 2012; Dei, 2000). Indigenous knowledge is knowledge that is imbedded in people's memories and a lack of interest from younger generations has meant that much of this knowledge is lost. A breakdown in traditional communication channels and an evolving lifestyle of younger generations seeking better prospects away from local communities has caused the older generation to pass away without sharing their indigenous knowledge with the younger generation. A lack of interest from government authorities, who prefer to use newer technologies and approaches, have also led to reduced interest in indigenous knowledge (Langill, 1999; Sithole 2007).

A ray of hope for indigenous knowledge is that although it is local, it may not necessarily be completely traditional. What this means is that indigenous knowledge may not only include ideologies that have originated within local communities; it can also incorporate outside or scientific knowledge. An example of this is a situation where the local community translate weather information forecast through multimedia, then use this information to relate to local weather knowledge obtained from past experiences (Lopez-Carresi *et al.*, 2014). This is an example of combined knowledge (a combination of scientific and local knowledge). Combined knowledge has been discussed for use in disaster risk reduction (Rist and Dahdouh-Guebas, 2006), although it has been employed to tackle very specific problems in the field of disaster risk reduction (Briggs and Sharp, 2004). The result of such a combination of knowledge may be beneficial; however, it can result in negative outcomes for communities as well. An example where this combination has led to a negative outcome is in the rural communities in Papua, New Guinea. These communities began utilising scientific knowledge in developing new cash crops, while at the same time, growing traditional crops using local knowledge. This has led to diverse crops and increased income; however, it has also resulted in landslides and erosions due to improper land use (Rist and Dahdouh-Guebas, 2006). Combined knowledge may yield positive results in some respects, but it is very important that more research be conducted in this area for disaster risk reduction (Wisner *et al.*, 2004). The concept of Transferable Indigenous Knowledge has been developed by the Disaster Reduction Hyperbase initiative. The idea is about applying indigenous knowledge that comes from a region to other regions; this knowledge used would have to be very reliable, tried and true. It is important to note that developing disaster risk reduction strategies with a combination of local knowledge and scientific/technological knowledge should be done cautiously, as both emanate from different origins (Shaw, 2009).

2.11: Overview of Hazards and Disasters in Nigeria:

Communities in African countries have always found ways to adapt to their changing environment. Continuous threats from the environment have enabled various communities in Africa build resilience to external shocks for generations. While such resilience might have helped keep populations alive, it does not help in the struggle for sustainable development within the continent. There is still widespread poverty in the African region as most individuals in various communities live on less than a dollar a day. Diseases affect various communities in Africa, with Sub-Saharan Africa (home to countries such as Nigeria) being home to the highest number of individuals living with people living with the HIV virus. Famine and food shortages affect various parts of Sub-Saharan Africa and the impact of climate change has led to continuous droughts, flooding and other extreme weather conditions in the region (IFRC, 2011). The issue of disasters in Sub-Saharan Africa is very prevalent. Between 1974 and 2003, East and West African countries have been the most affected by disasters across Africa. Exponential population growth, a lack of resources to help communities adapt, power inequalities and poverty are some of the factors that make communities in Sub-Saharan Africa more vulnerable to the impacts of new and continuous disasters (Lukamba, 2010). Countries within the Sahel region of Africa have experienced continuous droughts that began in the 1950s and led to numerous deaths and hardship in the 1970s. There is evidence that unpredictable patterns of rainfall across various countries has caused droughts that have persisted over years and severe flooding that has displaced communities (WHO, 2004; IFRC, 2008). West African countries have been affected with disease epidemics, desertification, floods and various other hazards and disasters.

With a population of over 180 million people and an estimated annual population rise of over 4%, Nigeria is one of the most populous countries in West Africa (World Bank, 2016). This means that various hazards and disasters, recurring and new ones alike annually affect many people. According to data compiled for CRED (Centre for Research on the Epidemiology of Disasters) by Guha-Sapir (2015), between 1990 and 2014, flooding has been the most persistent disasters that have affected communities in Nigeria. Flooding accounts for 83.3% of all disasters that occurred within this period, with storms accounting for 8.3% of disasters within this time. Landslides and severe temperature rises account for the remaining 8.4% of disasters' occurrence between these years respectively (Guha-Sapir, 2015). Although the changing climate in recent years have contributed to the high intensity rainfalls which have led to flooding throughout the country, other hazards and disasters affect Nigerian communities. Available data shows that various communities in Nigeria have been affected by several types of hazards and disasters over the years. These disasters range from disease epidemics and severe droughts, to industrial accidents and explosions. All these disasters have led to thousands of deaths and have affected millions of people (Guha-Sapir, 2015). Disasters that occur in the Nigeria are of various categories – those caused by natural hazards and those that are results of human error and technological failures. One of the most memorable human-induced disasters that occurred in Nigeria is the Nigerian Civil War (also known as the Biafran War). This disaster was caused by politics in the geographical regions of the country after the independence from Britain. Sectoral politics has been blamed the Nigerian Civil War (also known as the Biafran War). It is important to go back to some history about Nigeria, to understand this notion. To efficiently rule Nigeria, a country made up of various ethnic groups, the British colonialists amalgamated the Northern and Southern regions in 1914. By the time the British were leaving in 1960, the ethnic divisions in the country were beginning to become evident in a country which had initially been predicted to become sub-Saharan Africa's most promising postcolonial nations (Crowder, 1978; Zachernuk, 1994; Heerten and Moses, 2014). By 1963, the country had been divided into four states comprised mainly of Hausa-Fulani in the North, Igbos in the East, Yorubas in the West and a multi-ethnic Midwestern state created out of parts of the Western region. The three largest tribes in the country (Igbo, Yoruba and Hausa) competed for national resources and politicians from each of these three dominant ethnic groups did not want to be dominated by the other. This escalated into fierce election battles marred by ballot-rigging and manipulation, leading to increased isolation of the Igbo ethnic group (Crowder, 1978). A series of coups were carried out by mostly Igbo military officers and one of the coups in January 1966 led to the death of Alhaji Ahmadu Bello, who was the first and only premier of the Northern region.

After power was handed over to the top Igbo military officer (General Aguiyi Ironsi), a counter-coup in late June 1966 led to the killing of General Aguiyi Ironsi and power handed back to the Lieutenant-Colonel Yakubu Gowon from the North. Violence against the Igbos increased across the country, with the government ignoring the massacres of thousands of Igbos across Northern Nigeria. This led to the fear that the North wanted to wipe out the Igbos from Nigeria and led Eastern Nigeria, under the military governorship of Ojukwu, to call for autonomy. After failed negotiations with the government, the Eastern region seceded from Nigeria and declared itself as the Republic of Biafra. This led to the outbreak of war a few weeks later (Heerten and Moses, 2014). The war led to massive starvation in Eastern Nigeria. Pictures of starving children were shown across the globe (these became known as 'Biafran Babies') (Akinyemi, 1972). The war led to a humanitarian crisis across Eastern Nigeria resulting from widespread hunger, malnutrition and disease outbreaks. The hunger was caused by the Nigerian government who blockaded land and sea supply of food to Eastern Nigeria, hence causing mass starvation which led to the death of thousands. It is estimated that the combined effects of starvation, diseases, combat and shock led to the death of over a million lives in Eastern Nigeria (Igbokwe, 1995: 15). The Nigerian Civil War also exposed the biased nature of aid agencies as the Red Cross was accused to abandoning the people of Biafra while taking sides with the Nigerian government, due to the interest of the British in Nigeria's crude oil (Rantimi, 2017). It was on this basis and the plight of the Biafrans that the organization, MSF (*Medecins San Fontieres*), was formed (Brauman, 2012). Although the Civil War has long gone, there is continuous agitation for an autonomous South-East Nigeria and lack of trust between the Igbos and the Hausas continuously contribute to conflicts across the country. Apart from these man-made issues, natural hazards influence conflicts and lead to disasters in Nigeria (Rantimi, 2017).

Natural hazards which have led to disasters in Nigeria include the recurring droughts which have affected some northern states in Nigeria that fall within the Sahel and Sudan regions of Africa, since the beginning of the 20th century. The droughts, which are products of the changing climate and weather patterns, have been sustained by severe deforestation, overgrazing and inadequate farming methods across the northern states (Olagunju, 2015; Abubakar and Yamusa, 2013). The droughts have led to increased poverty, starvation, famine and socio-economic instability, due to poor crop yields. It has also led to forced migration and conflicts across this region of the country and beyond. This is because of loss of natural resources, biodiversity and habitats. The recurring drought has led to increased poverty across local communities in northern states of Nigeria, as most rural communities rely on agriculture as their main source of income. Water supply is also affected as most rivers in the north of Nigeria flow into Lake Chad, which is drying up (Abubakar and Yamusa, 2013). Drought and desertification also go together, leading to desert encroachment across the states in northern Nigeria. Unsustainable management of the environment has led to droughts and desertification affecting fifteen states across northern Nigeria. This has negatively affected the GDP of Nigeria as a whole, as this region of the country supply the bulk of agricultural products such as tomatoes, peppers, onions, beans and livestock such as cattle (Olagunju, 2015). The effects of these droughts and desertification in the north of Nigeria are increasing cost of food crops in markets and scarcity across the country (Olagunju, 2015). As agriculture contributes to around 40% to Nigeria's GDP, continuous drought would lead to famine and sustained scarcity. Plant and animal species that are not drought-resistant have gone extinct in areas affected by droughts. Another sector affected by drought in Nigeria is the power-generation sector. With water sources drying up in the north of the country, there is diminished hydropower to generate enough electricity required across all the regions of the country (Abubakar and Yamusa, 2013). The issues of drought and desertification threaten the economic sustainability of Nigeria.

One way the Nigerian government tried to tackle the drought in the past was the establishment of the Rural Basin and the Rural Development Authorities, whose responsibilities included installing irrigation infrastructure across the country. The Nigerian government has also invested over 3 billion dollars in irrigation schemes across Northern Nigeria, but lack of maintenance and technical problems have led to the inefficiency of such schemes across the region (Othman *et al.*, 2010). International organisations such as the International Institute for Tropical Agriculture (IITA), the International

Centre for Crop Research in Semi-Arid Tropics (ICRISAT) and the national Institute for Agricultural Research (IAR) have provided drought-resistant species of various crops to farmers across the region, to help sustain agriculture. To help preserve food crops and store grains produced in the North, the Federal government established grains centres made up of twelve silos with a combined capacity of 350,000 metric tonnes, to help mitigate the impact of droughts in Northern Nigeria. There are plans in place to build twenty more silos at the site. Agencies like the National Emergency Management Agency (NEMA) and the Nigerian Meteorological Agency (NIMET) provide relief to communities affected by drought and forecast weather patterns to help farmers plan, respectively (Abubakar and Yamusa, 2013). The continued desertification in Northern Nigeria has contributed to making the droughts more difficult to control. A decrease in rainfall in drylands, high temperatures, poor vegetation growth and deforestation are some of the contributing factors. Human factors have also led to desertification. The over-exploitation of land resources and over-cultivation of agricultural lands in order to meet the dietary requirements of an ever-growing population has led to desertification. Overgrazing has led to shortages in food supply for cattle. Some Northerners (the Fulani) are nomads and shortages in livestock food supply have forced them to migrate to other areas, searching for arable grazing grounds for their cattle. This has led to conflicts since the turn of the 20th century. Clashes between farmers and herders have grown over the years, in the North as well as in the South, East and Western regions of the country. These clashes have led to loss of lives and increased tension between different ethnic groups. The situation is worse with the emergence of Boko Haram (Olagunju, 2015). In the past, Fulani herdsmen drove their cattle around the Sahel region. However, intensifying droughts made grazing lands more difficult to come by and to feed their cattle, they found themselves grazing on lands owned by Christian farmers in the South and East. This has led to violent clashes, not only with Christian farmers, but with other Northerners as well (Okoli and Ifeakor, 2014; Olagunju, 2015).

While the conflicts between Fulani herdsmen and farmers in Nigeria and Boko Haram insurgency are separate issues, the terrorist organisation have used the excuse of 'fighting Christians who carry out acts of violence on Fulani herdsmen' to kill people and commit atrocities. There have also been reports that due to the increased poverty in the North, with 70% of rural Northerners living in absolute poverty, people are easily enticed to join Boko Haram. This gives a platform to have a purpose and fight the government, while blaming the same government for economic woes caused by environmental factors. The government of Nigeria has recognised that poverty due to poor agricultural output in the North has led to an increase in the insurgency (Eichelberger, 2014). While there have been various initiatives in the past to tackle the problems, inadequate policies and sectoral politics has allowed these problems to remain in place (Okoli and Ifeakor, 2014). Floods are one of the biggest threats to the people of Nigeria. In 2012 alone, floods directly led to the deaths of 363 people and displaced 2.1 million people across the country. Poor environmental conditions and insufficient drainage systems are some of the reasons for the terrible impact of floods across Nigeria. According to data from CRED EM-DAT, counting from the early 20th century, floods have affected over 10 million Nigerians and have directly led to the death of over a thousand people. Economic damages from the direct impact of floods in Nigeria run into hundreds of millions of dollars (Guha-Sapir, 2015). It is important to note that while diseases like malaria and conflicts in different regions might have claimed more lives in Nigeria, floods displace the most people across the country, with about 20% of the Nigerian population being at risk of flood hazard and disaster. Natural forces and human activities cause flooding in Nigeria. Torrential rainfall, damaged water pipes and burst dams have all led to flooding across the country. Floods in Nigeria can be coastal floods, flash floods, river floods and urban floods. Heavy rains during the rainy season lead to loss of properties, farmlands and livelihoods annually. Such heavy rains have also led to burst dams that have led to loss of lives and livelihoods. Poor drainage in urban areas across the country has led constant flooding during the rainy season. Floods affect all regions across the country (Etuonovbe, 2011).

The flood of 2012 was one of the worst witnessed across the country for over 50 years (Okorodudu-Fubara, 2013). The floods led to the loss of properties, lives, businesses and various infrastructure. There were uncertainties about food supply and food availability. The impacts of the floods were projected to be medium to long-term (ReliefWeb, 2012). Flooding in Nigeria can be traced back to the 1950s, when seasonal fluctuations in weather patterns led to rivers breaching their natural defences. Flooding usually occurred when major rivers like the Niger, Benue and Hadeja overflowed their boundaries, flooding communities in various states of the country (Nkwunonwo *et al*., 2015). These days, floods usually occur during the rainy season months and affect not just rural communities located next to large rivers, but also major cities. Rapid population growth and urbanisation of cities across Nigeria has led to more people becoming vulnerable to floods. While growth and urbanisation may be viewed as development, it is counter-productive in the case of various Nigerian cities as poor urban planning continues to put people at risk of floods. The government of Nigeria has tried to use various measures to handle the issue of flooding across the countries, but most strategies have been inadequate, and the hazard is continuous across various communities, especially during the rainy season. The recurring flooding raise concerns on food security, vulnerability, waste management, healthcare and urban development in the country.

According to research by Nkwunonwo *et al* (2015), the floods of 2012 experienced in Nigeria meant that it was the worst floods suffered by any African country in terms of affected communities and economic impact, between 1985 and 2012. It also placed Nigeria on number three on the list of countries most affected by floods around the world, during the same period (Nkwunonwo, 2015). The floods destroyed farmlands, estimated to be over 1.9 million hectares. They contaminated communities' water supplies, led to the deaths of hundreds of people while making others homeless. Economic activities across Nigeria nosedived and farmers suffered heavy losses. This led to food shortages across the country and ridiculously soaring prices of commodities. The floods also led to the death of millions of livestock. It is estimated that 2.29 trillion naira was lost to the floods and its impacts; this amount represented 2.83% of the total GDP of 81 trillion naira for 2013 (Erekpokeme, 2015; Okoruwa, 2014). The Nigerian government tries to mitigate threats caused by high intensity rainfall which lead to flooding in various parts of the country. This mitigation is carried out using several initiatives, although most have not been successful. The increased impacts of floods across the country led to the establishment of the Federal Environmental Protection Agency (FEPA) under the Ministry of Works and Housing in 1988 and the Federal Ministry of Environment (FME) in 1999 (Ibitoye, 2007; Obeta, 2009; FME, 2012). The Federal Ministry of Environment is affiliated with other agencies in Nigeria that are in one way or another, responsible for flood management in the country. Some of these agencies include National Emergency Management Agency (NEMA), National Orientation Agency (NOA), National Environmental Standards and Regulations Enforcement Agency (NESREA), Nigerian Meteorological Agency (NIMET) and Nigerian Hydrological Services Agency (NIHSA) (Nkwunonwo *et al.*, 2015). Despite the existence of these agencies, floods continue to wreak havoc on various communities within states of Nigeria. One of the reasons for this may be the nonchalant attitude of the Nigerian government towards preparedness in case of hazards. This was quite evident during the floods of 2012. The Nigerian Meteorological Agency had earlier warned the Federal government, before the onset of the rains, that there would be very high intensity rainfalls that could lead to severe flooding in over 12 states of the country that year. However, the Federal government ignored the warning and no strategies were implemented, in preparation for the floods. To make matters worse, a dam in neighbouring Cameroun released water that ran into the Rivers Niger and Benue, causing them to overflow their banks and add to the floodwater (Odeh, 2014; Erekpokeme, 2015).

In a bid to mitigate the impacts of floods across the country, the Nigerian Federal government commenced the installation of 307 flood early warning systems in fifteen states of the country; the states are Niger, Nasarawa, Cross River, Rivers, Lagos, Oyo, Osun, Ogun, Ondo, Kwara, Akwa-Ibom, Imo, Anambra, Abia and Enugu states, respectively (Okoruwa, 2014). It remains to be seen how effective these warning systems would be in the future of flood hazard management in Nigeria. The Federal government has also tried to equip the Nigerian Meteorological Agency (NIMET) with

advanced technology, to assist in better weather forecasting. To help in the rebuilding of communities affected by the floods of 2012, the government released 17 billion naira to states affected by the floods. There are also plans to build more dams across the country to mitigate flood risks and help in power generation and agricultural development (Anugwara and Emakpe, 2013). In the absence of government strategies for managing floods, local people have used local knowledge to adapt in the event of minor flooding in local communities across the country. Farmers in Southern Nigeria and some parts of Western Nigeria use mounds for floods mitigation; some farmers in Western Nigeria grow local flood resistant crop varieties. Local knowledge has also helped communities in Nigeria observe weather patterns and predict rainfall intensity in some cases (Umoh, 2013; Fabiyi and Oloukoi, 2013). Rainfall has not only brought incessant flooding in Nigeria; it has also brought the issue of erosion to the limelight as one of the biggest problems faced by Nigerians. Soil and gully erosions have created many issues for people in Nigeria, especially in rural communities (Abdulfatai *et al.*, 2014). Erosion is a menace in many states of the country, with the Southeast region being the mostly affected by it. Gully erosion is the most prevalent type of erosion in Nigeria and the Southeast region of Nigeria suffers the most from its impacts. It has led to loss of agricultural lands, properties and livelihoods. While rainfall contributes to the expansion of gullies, other factors influence them as it takes years for erosion hazards to expand and cause problems for households in communities. Increased rainfall over the years in the Southeast region of Nigeria has led to gully erosion (Igwe, 2012).

The annual rainfall in the Southeast region of Nigeria is 2500mm, compared to the 1500mm of rain experienced in the Middle Belt and Northern regions. The rains are long and heavy, lasting from March till October every year (Igwe, 2012). The topology of the land, soil properties and land management methods are other factors that have contributed to the expansion of gully erosions. The geology of the Southeast region of Nigeria makes it more prone to erosion hazards. Appropriate land use practices should be a necessity in this region, but this is not so (Ezezika and Adetona, 2011). Studies carried out in areas of Anambra state show that while the topology of the soil causes gully erosion to occur, it is the unsustainable land management practices of the local people such as continuous cropping, which lead to the expansion of these gullies to cause disasters (Akpan *et al*., 2009). Expansion, urban development and the steady population increase has led to the loss of vegetation and deforestation across different regions of the country. This has contributed to the expansion of gully erosions, not only in the Southeast, but in the North and West as well (Akpan *et al.*, 2009). A gully erosion site in Aguata in Anambra state of Nigeria threatens to swallow up the houses of over 800 families. In Edo state, over 400 buildings were lost to gully erosion in 2013. Scores of people have died from the direct impact of gully erosions across the country. The best way of controlling erosion hazard is to control it at a very early stage of its onset (Obidimma and Olorunfemi, 2011). However, if this cannot be achieved, as is the case with various erosion across the country, various measures can be taken to prevent future disasters (Abdulfatai *et al.*, 2014). With the help of the World Bank, the Nigerian government is trying to tackle the issue of erosion through the Nigerian Erosion and Watershed Management Project (NEWMAP). The project is aimed at building basic infrastructure to support initiatives that would help in reducing land degradation, provide information on erosion to local people in collaboration with various institutions across the country and help in strengthening Nigeria's capacity to deal with the problems associated with climate change (World Bank, 2017). The project is in line with Nigeria's Vision 2020 agenda. The Vision 2020 is the long-term development and resilience goal of the government to make the Nigerian economy rank among the top 20 economies of the world, by the year 2020 (NEWMAP, 2017; NigerianStat, 2010).

The discovery of crude oil in Nigeria has been a blessing and a curse. Oil has been a blessing to Nigeria as it has contributed to the country becoming one of the highest oil exporters in the world; it has been a curse as it has led to the devastation of local communities and underdevelopment in communities, especially in the South of the country. A phenomenon known as 'oil curse' exists in countries in Africa (Nigeria included) and the Middle East. In these countries, oil resources have contributed to underdevelopment, civil wars, corruption and human rights violations (Ross, 2011). The area of oil exploration in Nigeria is the Niger Delta region located in Southern Nigeria. Communities in the Niger Delta have been devastated due to oil exploration, which has led to a globally recognised environmental disaster. Environmental deprivation, loss of livelihoods and contaminations are just some of the resulting impacts of the oil exploration in the Niger Delta (Odularu, 2008). The Nigerian economy thrived on the exportation of agricultural products, before the discovery of crude oil. This ensured that the stable economy was a result of demanding work, dedication and productivity. The shift from dependence on agricultural exportation to the exportation of crude oil has divided opinions for decades (Oloruntegbe *et al*., 2009). Shell British Petroleum discovered crude oil in a village known as Oloibiri in Bayelsa state of Nigeria in 1956. By 1958, commercial production of the crude oil commenced in earnest. Now, over 10 oil companies operate more than 1,480 oil wells in the Niger Delta region of the country (Onuoha, 2008; Kadafa, 2012). After being refined, the crude oil obtained from the Niger Delta yields petroleum and natural gas. The oil and gas sector in Nigeria accounts for Nigeria's highest revenue from exports (Table 2.2) and provides 35% of Nigeria's GDP (OPEC, 2017).

Table 2.2: Nigeria's crude oil revenue

Value of Nigeria's exports	**45,365 (million dollars)**
Value of Nigeria's petroleum exports	**41,818 (million dollars)**
Nigeria's proven crude oil reserves	**37 million barrels**
Nigeria's proven natural gas reserves	**5.2 billion cubic metres**

Source: Organization of the Petroleum Exporting Countries (OPEC) (2017)

Oil production in Nigeria provides the country with the bulk of revenue generated from exports and a good amount of the GDP. In Africa, Nigeria boasts of the largest natural gas reserves across the continent. However, the drilling of oil in Nigeria has led to issues such as loss of biodiversity, loss of soil fertility, erosions, flooding, oil spillages, fires, land and environmental degradation, and severe pollution of the noise, water, sewage and atmospheric varieties. It has caused devastation for communities, hardships for people and loss of livelihoods for the people living in that region of the country (Kadafa, 2012). The Niger Delta region is home to over 20 million people, with majority of those affected by the crude oil production being the Ogoni indigenous people. The Ogoni people were very productive farmers in the past. Known as the 'food basket of the Niger Delta' due to the elevated levels of fertility of the soil they live on, they created a sustainable system of agriculture that respected the environment. Their traditions advocate for respect for the environment and nature. Sadly, the discovery of oil on their land has ruined livelihoods and avenues for sustenance (Legborsi, 2007; Eravwoke *et al*., 2014).

Poor maintenance of oil production infrastructure leads to oil spillage in communities while continuous gas flaring has contributed to environmental pollution. Agitations by the local people have led to constant clashes with oil companies, which has exacerbated into militancy (Marcon International, 2016). The focus on crude oil has not only affected the Niger Delta region; it has led to the annihilation of commercial agriculture and the collapse of infrastructure and social services across Nigeria. There has also been links between the discovery of oil and ethnic tensions between the North and the South, tensions caused by social and economic differences across different regions of the country. Although a large amount of revenue is generated from the export of crude oil and other petroleum products, there has been little interest in rebuilding the Niger Delta local communities where this crude is extracted from (Eravwoke *et al.*, 2014). According to the Federal Ministry of Environment (FME), the Commission on Environmental, Economic and Social Policy (CEESP), World Wide Fund (WWF) and other organisations, over 1.5 million tons of crude oil has been spilled in the Niger Delta region of Nigeria since the start of commercial crude oil production (FME *et al*, 2006). Such spillages have led to the loss of marine life, contamination of water supplies and destruction of natural habitats (Eravwoke *et al*., 2014). Apart from the contamination of the soil and the environment from spillage, there is also the issue of gas flaring. Gas flaring involves burning off excess natural gas obtained from the crude oil drilling, into the atmosphere (JINN, 2010 – Justice in Nigeria Now). Gas flaring contributes to climate change across the globe, acid rains in the Niger Delta region and the increase in atmospheric contaminants. Gas flaring causes the release of abnormally elevated level of carbon dioxide into the atmosphere, which is the main greenhouse gas. Acid rains have caused the corrosion of corrugated roofing sheets used to build houses and destroyed vegetation in the Niger Delta (Ajugwo, 2013). Atmospheric contaminants such as oxides of sulphur and carbon, ash and hydrocarbons from the act of flaring cause the acidification of soil. This leads to depletion in soil nutrients, leading to poor output of crops. These contaminants have caused total loss of vegetation and crops in communities where flaring have been carried out (Ubani and Onyejekwe, 2013). Other impacts of gas flaring in the Niger Delta region have been contaminated air which could lead to illness (Ajugwo, 2013).

Nigeria ranks as the eighth highest oil producing country in the world. The crude oil sector accounts for more than 95% of income generated from exports (World Bank Report, 2010). Households, the power generation sector, manufacturing companies, transport services, private vehicles' owners across the country, rely heavily on petroleum products. The irony remains that although Nigeria remains one of the largest producers of crude oil in the world, continuous scarcity and exorbitant prices of refined petroleum products in the country plague the lives of citizens and affects the country adversely (Ajugwo, 2013, Eravwoke *et al*., 2014). This has led to the problem of oil theft and vandalism of oil pipelines and installations, by people who want to take advantage of the scarcity and make quick money. An estimated six billion dollars has been lost by the Nigerian government from the activities of vandals. Oil vandalism contributes to oil spillages and cause fire outbreaks. Such fire outbreaks occur when the local people discover vandalised pipelines spewing crude oil. The rush to scoop up the crude oil with various materials and containers lead to the ignition of the oil, leading to fire disaster that has consumed hundreds of lives. Ruptured oil pipelines led to the death of over 1,000 people in a village known as Jesse in Delta state in 1998; oil pipeline vandalism led to an inferno that led to the death of over 300 people and destroyed properties and livelihoods in Adedje community in the Niger Delta in the year 2000. These are just a few examples of what has become a regular occurrence in the Niger Delta region (Oteh and Eze, 2012). These negative impacts of crude oil production in the Niger Delta compiled with the Nigerian government's dirty politics and ignorance of the plight of the local people led to the rise of the Niger Delta militancy, who have called for the independence of the Niger Delta region. The goal is to establish a separate nation from the Nigerian entity that would oversee the resources found in their own land, a goal vehemently rejected by the Nigerian government. The turmoil associated with Niger Delta militancy has led to kidnappings of expatriate oil company workers for huge ransoms, bombing of oil pipelines and other vices. Negotiations for peace between the government and the agitators in the Niger Delta continues, although very little has been done to curb the menace (Obi and Rustad, 2011). There have been collaborations between the Nigerian Federal government with organisations like the United Nations Environment Programme (UNEP) and

the United Nations Development Programme (UNDP) to start the cleaning up of the Niger Delta region, especially Ogoni land. Assessments are ongoing about how the clean-up process should begin (Eravwoke *et al*., 2014). Transportation of petroleum products across the country has also led to hazards exacerbated by the poor state of Nigerian roads. This has caused accidents which have claimed lives, injured people and destroyed properties worth millions of naira (Table 2.3).

Table 2.3: Disasters which have occurred during the transportation of petroleum products across Nigeria

Date	Incident	Outcome
10th June, 2008	Fuel tanker explosion on 3rd Mainland Bridge, Lagos state	Six vehicles burnt
11th October, 2009	Fuel tanker explodes after hitting an electric pole in Onitsha, Anambra state	70 people burnt to death
5th November, 2010	Fuel tanker explosion and fire along Ibadan-Ife highway	400 people killed and 150 vehicles destroyed
12th July, 2012	Fuel tanker incident at Okosia, Rivers state	121 people killed, 75 people injured
5th April, 2013	Fuel tanker incident along Benin-Sagamu expressway	30 people killed and several vehicles destroyed
2nd April, 2014	Fuel tanker incident at Ovia in Edo state	2 people killed and 4 people injured
31st May, 2015	Fuel tanker incident at Upper Iweka, Onitsha, Anambra state	60 people killed and many others injured

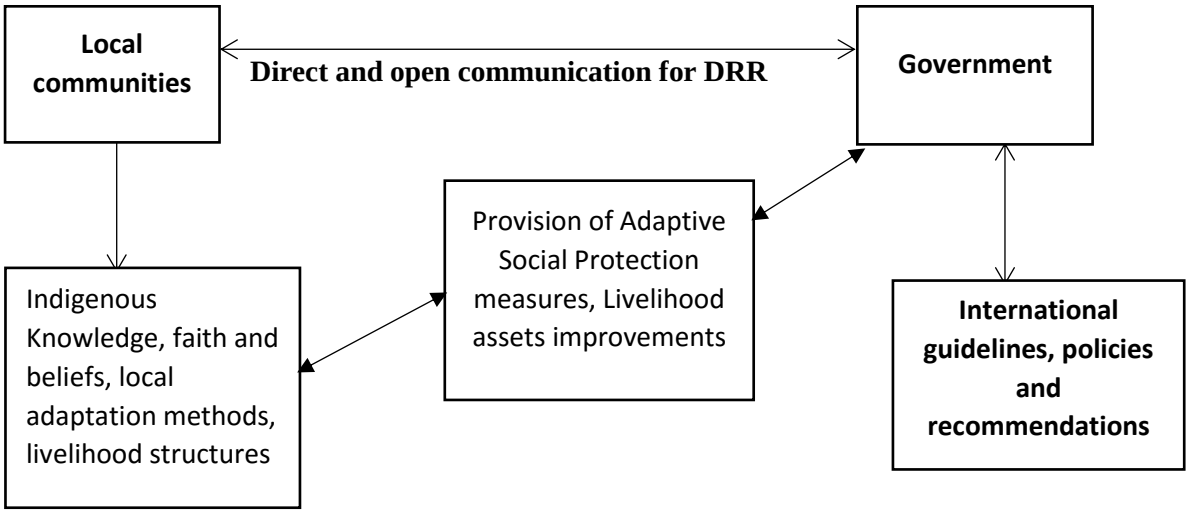
Source: Okoli and Atelhe, 2015

The problems associated with crude oil and petroleum products in Nigeria are numerous. These fuel tanker accidents are caused by the poor state of roads in Nigeria, human errors as well as road safety issues that are not given necessary attention. It is suggested that the Federal government intensifies its investment in the rail sector. The transportation of petroleum products by rail would significantly reduce the risk associated with road transportation. More funds invested in the building and maintenance of good roads across the country would go a long way to prevent disasters (Okoli and Atelhe, 2015).

2.12: Conclusion

The literature has shown that disasters continue to plague the African continent, with the impacts of disasters like droughts and floods continuously leading to devastation and affecting lives and livelihoods in Nigeria. While initiatives like the HFA and SFDRR would go a long way towards empowering and guiding governments on ways of implementing DRR strategies, local communities would always struggle to benefit from such strategies. The government plays a significant role in ensuring that households at the community level are protected from the impacts of hazards and disasters. For this to be successful there is a need for government policies to follow a bottom-up rather than a top-down model, with direct communication channels existing directly between local communities and government (see Figure 2.3). Local communities have survived the impact of hazards and disasters for generations. What they need are support systems from the government to empower them and for the government to recognise the importance of their local adaptation capacities. This should be the starting point for DRR – moving from the local community level, up to the implementation of international policies. Doing this would ensure that all stakeholders are carried along. From the literature, a model could be developed which captures all the crucial factors necessary for effective DRR in Nigeria.

Figure 2.4: Communication, Factors and Actions for Effective DRR in Community



Source: Author

This chapter has presented the available literature which concerns the issues and concepts influencing the outcome of this thesis. The next chapter elaborates on the aims, objectives of this and the methodological approaches to the research. The philosophical approach and various methodologies used to examine the perceptions of ethnicity, indigenous knowledge and sustainable livelihoods in the South-East of Nigeria, with focus on the Nsukka community of Enugu state are presented. Methods of data collection, research methods, ethical issues, the limitations of the research and the challenges faced throughout the progress of the research are also included in the next chapter.

3.0: RESEARCH METHODOLOGY AND FRAMEWORK OF METHODS

3.1: Introduction

This chapter seeks out to highlight all the methods, strategies and approaches that have been used in this research. The first part of this chapter focuses on methodological approaches which form the basis of the research. The chapter sets out the aims and objectives of the research, while explaining why different approaches were used to collect data. The chapter tries to understand the research from a philosophical perspective and highlights the importance of using mixed approaches in gathering data for such research. The chapter goes on to explain the approaches used in gathering data, such as ethnography, participant observations, sampling, use of questionnaires, interviews and key informants' interviews. The strengths and weaknesses of each method used in the research are also highlighted. The limitations of the research and the challenges faced in undertaking this research are mentioned in this chapter as well. The second chapter of this thesis has served as an introduction to the various theoretical bases for this research. The literature tries to understand disasters from an African perspective, how institutions shape how disasters are perceived, conditions and factors which shape how members of the community perceive disasters, the importance of local knowledge and methods of adaptation, and the underlying theories that can be used to understand the various notions of all stakeholders. It is a known fact that the impacts of disasters, especially due to the changing climate, are on the rise. However, the impacts are more pronounced in developing nations (UNDP, 2004). While this is the sad reality, it is important to recognise that communities within these developing countries have always found ways of adapting to these impacts using their local knowledge and strategies for survival (Wisner et al, 2012; Gaillard and Mercer, 2012). Numerous factors and conditions have continually shaped how communities associate with disasters. Communities are shaped by common beliefs, geographic locations, ethnical affiliations as well as political notions (Fair *et al.*, 2013).

3.2: Sources of Data

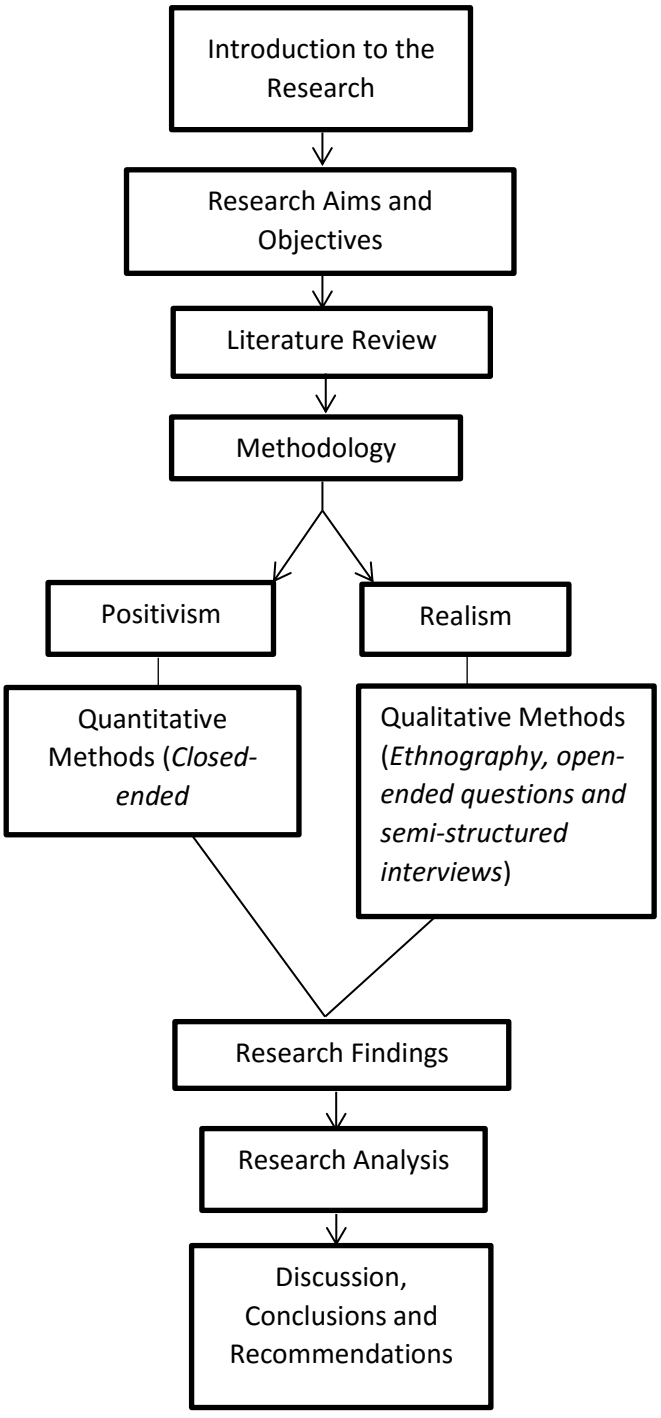
Data for this research were obtained from secondary and primary sources. Secondary sources included journal articles, scientific papers, books, newspapers, multimedia and reports. In situations where maps and diagrams were obtained from these secondary sources, adequate reference was provided to validate the sources. Primary sources provide most data in the research. These data were obtained from the field. By spending time in the field, the researcher used questionnaires, semi-structured interviews, observations and oral history to obtain data from local people. These provided the data on the perceptions of these local people in Nsukka communities and environs, to hazards and disasters. There were also some stakeholders' semi-structured interviews which provided data for the work. Such stakeholders included staff from the local government, staff from the South-East office of NEMA in Enugu state, local chiefs, members of clergy and youths.

3.3: Research Design:

This research utilised the mixed methods approach to research. For a complex topic which involves DRR, people's perceptions and approaches to everyday life, such an approach gave depth to the research. A mixed methods approach ensures that all aspects and related concepts that may be associated with the research aims and objectives are explored. This research was conducted to understand the perceptions of ethnic communities to hazards and disasters, and the impacts of local knowledge and sustainable livelihood assets on DRR. The ethnic community in this case is the Ibo people in local communities that make up Nsukka in Enugu state. To do this, the research began by going through the literature to see what has been said about the various elements that make up the research objectives. In trying to choose the various methods which would provide the required data for the research, the researcher had to understand the philosophical positions on social research. These

shaped the researcher's mind as he went into the field and gathered data using various methods adopted from qualitative and quantitative approaches. The next stage involved analysing the data and presenting the findings.

Figure 3.1: The Research Design



Source: Author

3.4: Mixed Methods Research:

The debate among researchers on which methods are appropriate for research has been happening for over a century. There is ongoing disagreement on whether quantitative or qualitative methods are better for research (Lincoln and Guba, 1985). Core believers in the quantitative research approach make arguments based on positivist philosophy (Ayer, 1959; Maxwell and Delaney, 2004). The quantitative idealists believe that social research should be objective, and that the researcher is separate from the phenomenon under observation (Johnson and Onwuegbuzie, 2016). Qualitative idealists, on the other hand, reject the positivist approach to research. Their arguments are based on the philosophies of idealism, relativism, constructivism and humanism. Qualitative idealists argue that multiple realities exist in the social world and that is impossible to fully discern cause and effects in this social world (Smith, 1983; Lincoln and Guba, 2000). Both sets of idealists believe that their own paradigm is the perfect paradigm towards obtaining credible research. They use the *incompatibility thesis* approach that argues that quantitative and qualitative methods should not be mixed in research (Howe, 1988). Quantitative idealists claim that science is only concerned with confirming or refuting a hypothesis through objective approaches. What these idealists fail to recognise is the importance of the 'human factor' and decisions are made by researchers who are human and the decisions on what needs to be studied and methods to be used for research, are taken by humans. On the other side of the argument, the qualitative idealists use methods that prevent the development and use of systematic standards for assessing the quality of research (Johnson and Onwuegbuzie, 2016). There is a need to take a step back and realise that being an idealist in one paradigm does not mean ignoring the possibility of combining ideas from both paradigms to carry out credible research. It is necessary to utilise the strengths and ignore the weaknesses of both paradigms, as a reliable approach towards research (Onwuegbuzie and Leech, 2004a; Johnson and Onwuegbuzie, 2016). There are advantages and disadvantages to every research approach, as seen in Table 3.1; what matters is that a researcher utilises the best methods to obtain the data needed for a research.

Table 3.1: Some advantages and disadvantages of Quantitative and Qualitative Researches

Quantitative Research	**Qualitative Research**
Advantages: - It tests and validates theories about how and why things happen. - It can generalise findings when data is based on random samples. - It allows for the creation of credible cause-and-effect relationships. - It allows for quick collection of data (for example, through telephone conversations). - It is useful in studies involving a lot of people. - The results from quantitative research are mostly independent of the researcher.	***Advantages:*** - Data obtained are based on the participants' categories of meaning. - It helps in the study of cases in-depth, while helping to describe complex phenomena. - It helps researcher determine how participants interpret constructs and phenomenon. - It is responsive to local situations. - Data is collected in a natural setting. - It describes phenomena embedded in the local setting, in rich details.
Disadvantages: - The categories and theories used may not reflect the local understandings. - Focus on theory and hypothesis may cause the researcher to lose important phenomena which could help the research. - Knowledge generated from quantitative research may be too abstract or general to be applied in specific local contexts.	***Disadvantages:*** - The findings in qualitative research may not be generalised, as such findings are usually specific to a set of people. - It takes a long time to gather data in this research. - Data analysis takes a long time. - The research can easily be influenced by the researcher's bias.

Source: Johnson and Onwuegbuzie, 2016

Mixing methods helps to bridge the rift that has been created by disagreements over qualitative and quantitative methods (Onwuegbuzie and Leech, 2004a; Johnson and Onwuegbuzie, 2016). Mixed methods research, as defined by Johnson and Onwuegbuzie (2016), is *'the class of research where the researcher mixes or combines quantitative and qualitative research techniques, methods, approaches, concepts or language into a single study'* (pg. 17). The origin of the mixed methods approach can be traced back to psychosocial work carried out by Campbell and Fiske in the 1950's (Creswell, 2003). It is important to note that a multi-methods approach in research is quite different from mixed methods, as it entails the use of different methods from the same research paradigm (Hall, 2012). Mixed methods research goes beyond the mixing of various methods in research. It is an approach that ignores paradigms. Although no research is free from paradigms, mixed methods research tries not to focus on singular paradigms (Hall, 2012; Johnson and Onwuegbuzie, 2016). What a mixed methods approach in research does is that it creates the best opportunities for answering research questions (Johnson and Onwuegbuzie, 2004). As presented in Table 3.2, there are different purposes for mixing methods in research. These purposes are for research triangulation, complementarity, development, initiation and expansion (Greene et al, 1989).

Table 3.2: Purposes for mixing methods

Purpose	***Description***	***Rationale***	***Source of Theory***
Triangulation	Seeks convergence, corroboration, correspondence of results from the different methods.	To increase the validity of constructs and inquiry results by counteracting or maximizing the heterogeneity of irrelevant sources of variance attributable to bias.	Campbell and Fiske (1959) Webb et al (1966) Denzin (1978) Cook (1985) Shotland and Mark (1987).
Complementarity	Seeks elaboration, enhancement, illustration and clarification of the results obtained from the application of one method with the results obtained from the application of another method.	To improve meaningfulness, interpretability and validity of constructs and results by focusing on the inherent method strengths and counteracting inherent biases.	Rossman and Wilson (1985) Greene and McClintock (1985) Greene (1987) Mark and Shotland (1987)
Development	Seeks to use the results from one method to help develop and inform another method, where development is broadly construed to include sampling and implementation, as well as measurement decisions.	To increase the validity of constructs and inquiry results by capitalizing on inherent method strengths.	Sieber (1973) Madey (1982)
Initiation	Seeks the discovery of paradox and contradiction, new perspectives of frameworks, the recasting of questions or results from one method with that from another method.	To increase the breadth and depth of inquiry results and interpretations by analysing them from the different perspectives of different methods and paradigms.	Rossman and Wilson (1985) Kidder and Fine (1987)
Expansion	Seeks to extend the breadth and range of inquiry by using different methods for different inquiry components.	To increase the scope of inquiry by selecting the methods most appropriate for multiple inquiry components.	Sieber (1973) Madey (1982) Mark and Shotland (1987).

Source: Greene et al (1989)

No research approach is without its strengths or weakness and this is true of the mixed methods approach to research as well. However, the use of mixed methods approach in research eradicates some of the problems that are encountered when using a single research method. In employing quantitative and qualitative approaches in research, the mixed methods approach utilises the strengths of both approaches (Sechrest and Sidana, 1995). Also, the use of mixed methods encourages researchers to use different methods which are relevant in answering their research questions. The bias caused by the preconceived notion on the relevance of using a simple paradigm approach is greatly reduced. As with every approach to research, there are advantages and disadvantages of using a mixed methods approach in research (Table 3.3) (Johnson and Onwuegbuzie, 2016).

Table 3.3: Strengths and Weaknesses of the Mixed Methods Approach

Strengths	**Weaknesses**
- It allows for the use of pictures, words and narrative to give meaning to numbers; numbers can also be used to add precision to pictures, words and narrative. - Strengths of one method can be used to overcome the weakness of another method in the research. - It gives a stronger evidence for conclusion through the corroboration of the findings in the research.	- It is difficult for a single researcher to carry out a mixed methods research, due to the fact that methods come from both qualitative and quantitative approaches. - It is expensive and time-consuming to carry out a mixed methods research. - The details of mixed methods approach remains to be properly worked out by research methodologists.

Source: Johnson and Onwuegbuzie (2016).

3.5: Philosophical Foundations of Research Methodology:

In carrying out research, especially those of the social variety, various methods and methodologies are employed. These methods and methodologies emanate from philosophical approaches that are used to gather information and knowledge related to specific questions and enquiries. Denscombe (2010) argued that there is need for research to be conducted by using various philosophical approaches and beliefs that go on to define the decisions taken throughout the research process. Research is carried out to find out information about the world in general. It is a process which requires the use of defined principles, beliefs and ideologies to obtain knowledge (Neuman, 2007). These come together to form the research paradigm. Guba and Lincoln (1994) defined a paradigm as '*a set of basic beliefs that deals with ultimates or first principles*' (p.105). It is a set of practices and beliefs that guides research (Morgan, 2007). A paradigm can be considered from different perspectives. It can be considered as 'world views' which cover all general beliefs about morals, values and making judgements as shared by the general world. This perspective highlights a paradigm as being shared understandings of the real world (Rossman and Rallis, 2003). A paradigm could also be shared beliefs of a community of researchers, such as specific practices employed in research within the field of pure sciences. It could also be a guideline that shows how research is conducted in a specific field (Morgan, 2007). This research is concerned with a fourth perspective that views paradigms from epistemological perspectives. Epistemological perspectives influence how the questions in research are answered through philosophy (Morgan, 2007). Philosophy (of science) is made up of three branches: ontology, epistemology and methodology. The methodology used in research is influenced by the ontology and epistemology. It also goes on to indicate the relationship between the researcher and the research

participants (Denzin and Lincoln, 2003). While it has been suggested that the research process should begin with a methods and methodological approaches (Crotty, 2002), a better suggestion was made by Grix (2011) who argued that the best way to approach research is by starting from the ontology, through the epistemology and into the methodology, which paves way for the research methods.

Ontology has been defined as 'the science or study of being'. It represents the assumptions made about what exists, the composition of what exists and how the components interact with each other, through social enquiry (Blaikie, 1993: p.6). Ontology asks questions about what exists and what the components of what exists are (Gomm, 2009). Ontology refers to the way the social world and the elements that make up this social world work together. The elements that make up this social world could be an ethnic group, a social institution or the family unit. Three ontological stances exist; they are realism, constructivism and objectivism (Matthews and Ross, 2010: pg. 24). This research adopts realist and constructivist approaches. Realism is a stance where its proponents accept that there is a world out there that is hidden within the social world and separate from social actors and influences. This different world out there can only be known through the senses and is a part of common-sense. It relates to our knowledge of the social world and influences the way we behave. Various unseen factors that influence the way people behave in the social world also make up this realism stance (Gomm, 2009; Blaikie, 1993). Constructivism on the other hand, is based on assertion that 'the social phenomena making up our social world are only real in the sense that they are constructed ideas which are continually being reviewed and reworked by those involved in them (the social actors) through social interaction and reflection' (Mattews and Ross, 2010: pg. 25). Constructivism is concerned with one's perception, derived from their understanding and interpretation of social phenomenon, and defines what social phenomenon mean to them (Mattews and Ross, 2010). The objectivity stance argues that the social processes that make up our social world exist on their own and do not interact with the humans who make up the social world. The objectivity stance is more affiliated to natural sciences and its proponents are usually scientists who study the natural world of plants, animals or elements and atoms (Mattews and Ross, 2010). This research adopts the realism and constructivist stances of ontology. From the realism stance, this research is not just concerned in identifying what hazards and disasters in the Nsukka community of Enugu state are; it wants to go deeper to understand the perceptions of local people to the hazards and disasters in their communities. The constructivism stance helps to understand how various stakeholders construct hazards and disasters that affect local people. Since people's perceptions shape the way they interact with their social world, understanding their approaches to the issues of hazards and disasters in the Nsukka community would be beneficial to this research. The second aspect of the philosophy of science is epistemology. Simply put, this is the theory of knowledge. It provides an understanding to what knowledge is and highlights the characteristics that differentiate knowledge from beliefs (Blaikie, 1999; Mattews and Ross, 2010). It is interested in 'questions about how we know what we know, how we can (or cannot) know what is true (Gomm, 2009: pg. 114). Three epistemological stances exist; positivism, interpretivism and realism (Mattews and Ross, 2010). This research follows two epistemological stances; positivism and realism. Philosophical foundations play a vital role in quantitative, qualitative and mixed methods research. However, it is an invaluable concept in carrying out mixed methods research. Understanding philosophical perspectives not only help a researcher in determining appropriate methods required for the research; the knowledge also goes a long way towards helping the researcher defend the credibility of the research (Plano Clark and Creswell, 2008).

3.6: Positivist Epistemology and Methods:

The Oxford Advanced Learners Dictionary (2000) simply defines positivism as 'a system of philosophy based on things that can be seen or proved, rather than on ideas' (pg. 1024). The term was first coined by Auguste Comte, a French philosopher who believed reality can be observed by using the senses and be made better by observation and experimentation (Mack, 2010). Positivism in research is a paradigm that is based on knowledge gathered by applying the senses in observation. It involves gathering knowledge about social phenomenon by observing the social setting without the researcher being influenced by the social setting. In this sense, the researcher is just an 'object' of no relevance to the happenings in the social setting and the data gathered by utilising this approach is usually quantitative data (Johnson and Duberley, 2000; Mattews and Ross, 2010). This paradigm is usually applied to research to test a hypothesis, to prove or disprove such hypothesis. It has also been called scientific paradigm (Mack, 2010). The positivist paradigm is derived from the natural science field that is based on conducting experiments to predict and explain the real world (Blaxter et al, 2006). The positivist paradigm can be categorised into ontological and epistemological assumptions of positivism (Mack, 2010). Ontological and epistemological philosophies have a tendency of overlapping each other and might be confusing (Mack, 2010; Crotty, 1998). As seen in Table 3.4, there are differences in both philosophical assumptions.

Table 3.4: Differences between ontological and epistemological assumptions

Ontological Assumptions	**Epistemological Assumptions**
- Reality is not influenced by the researcher in any way - Employing the senses help capture reality - Objects in social world are independent	- Social reality is studied using methodology from the social sciences - Knowledge is gathered from basic truths - Data obtained aims to prove or disprove a hypothesis, generating objective knowledge

Source: Adapted from Mack, 2010: *The Philosophical Underpinnings of Educational Research*

It is important to note that the positivist approach has been criticised for employing scientific methods in dealing with the social world of humans. Critics argue that links made in the field of natural sciences cannot be made in the learning environment to develop meanings (Mack, 2010). However, proponents of the positivist approach argue that scientific methods have good qualities that can, and should be applied, to the social research. Such methods have enabled positivists become believers of the probable, rather than proponents of absolute certainty (Mattews and Ross, 2010). The philosopher, Karl Popper went further to proclaim that theories are not certain truths but act as guides towards getting closer to the truth (Ernest, 1994). In this sense, all approaches and methods taken to get to the truth about the real world are valid. This point is further made firm by Crotty (1998) who said that a positivist 'claims a certain level of objectivity rather than objectivity, and seeks to approximate the truth rather than aspiring to grasp in its totality and essence (Crotty, 1998: pg. 29). Another type of approach has evolved from positivism, as the thinking after positivism. Known as post-positivism, it challenges the conventional concept of absolute truth of knowledge (Phillips and Burbules, 2000; Creswell, 2003). It is based on the notion that there must be a 'cause' which leads to an 'effect'. Post-positivists try to understand the reasons for specific outcomes. To do this, proponents of this approach use distinct ideas to analyse, by using methods such as developing research questions. Post-positivist approaches provide knowledge gathered from observing and measuring the objective reality of the real world, such as the gathering of data by observing and studying human behaviours in specific settings. A pre-selected hypothesis is then tested against the gathered data to confirm or refute its claims.

The post-positivist research begins with a selected hypothesis, gathers data to test the hypothesis and then evidence will determine if revisions to the hypothesis are needed and whether more research should be carried out (Creswell, 2003). However, this research is focused on the positivist approach to research. As has been mentioned earlier, the positivist approach to social research requires the gathering of quantitative data. Researchers who use the positivist approach obtain data by employing quantitative methodology. A quantitative research is a social research which aims to obtain data using empirical methods and statements (Cohen, 1980). It is research methodology which involves gathering data in a way that makes data quantifiable and statistically representable, which works towards supporting or refuting a hypothesis (Creswell, 1994; Creswell, 2003: pg. 153). In testing the hypothesis, data needs to be gathered through surveys methods and experimental designs. These limit the interaction between the researcher and those being researched. Structured interviews and questionnaires are some of the research instruments that could be used in gathering data (Clarke, 1999). Quantitative research flows through the research design, measurement procedures and methods, to statistical analysis (Williams, 2007).

3.6.1: Research Sample and Sampling:

For every research, several types of samples are used. This research involved gathering data from samples from various sources. The research questions, research approach and methodologies dictate the selection of the samples to be involved in a research. Sampling procedures have been broadly categorised into probability and purposive sampling (Teddlie and Yu, 2007). Sampling has been further classified into distinct types. Mattews and Ross (2010) classified sampling into random sampling, stratified random sampling, quota sampling, convenience sampling, purposive sampling, and theoretical sampling. However, these can be categorised into probability, purposive and convenience sampling, with these acting as platforms for bringing in mixed methods sampling. Probability sampling, usually used in quantitative research, involves the purposive selection of substantial number of units from the population. This selection of units must however, must try to include all the components and elements in the population. Probability sampling can be classified into random, stratified and cluster sampling. It can also be sampling done by using various probability and quantitative techniques (Teddle and Yu, 2007). Purpose sampling on the other hand is also known as nonprobability sampling. It involves the use of qualitative techniques to obtain samples (Tashakkori and Teddie, 2003a: pg. 713). This type of sampling can be used to obtain samples that are comparable, to gather samples relevant to unique cases or situations, and to gather sequential samples. (Teddle and Yu, 2007). Although quantitative research involves the use of probability sampling which permits the development of statistical data and qualitative research is concerned with purposeful sampling for obtaining a wealth of information, mixed methods research can be carried out using mixed sampling methods. Criterion sampling, random purposeful sampling and stratified purposeful sampling are some of the sampling techniques that originate from the combination of qualitative and quantitative techniques (Sandelowski, 2000). The researcher must acknowledge that the study may have limitations. Where an approach fails, the researcher should forego initial study then develop new research questions that would lead to a more successful study. An informal method known as judgemental sampling can be used by ethnographers. This method requires the researcher to use his or her own initiative to select appropriate individuals and subjects, as relates to the research questions. Factors which may aid in the successful selection of sample include mere luck, convenience or open opportunities (Fetterman, 2010).

3.6.2: Data Collection:

Data collection for this research involved various processes and the use of different methods. Quantitative and qualitative methods were used to obtain data, as this research utilised a mixed-methods approach. Two sets of questions were used to gather data – closed-ended and open-ended questions. Closed-ended questions were tested in the field by the researcher when he undertook a pilot study in Anambra and Enugu states of Nigeria. The pilot study was carried out by the researcher to assess the hazards and disasters which are prevalent in South-East Nigeria. A pilot study helps in the correlation of the research literature and prepares the researcher for eventual field work (Howe and Lewis, 1993). After the researcher returned from the pilot study, minor adjustments were made to the closed-ended questions. The idea of piloting research questions is important as it enables the researcher to identify gaps that could hinder the collection of required information (Howe and Lewis, 1993). The open-ended questions were developed to act as guidelines in conducting in-depth interviews. While the researcher was in the field for the pilot study, he tried out a sample of the open-ended questions with a respondent at a local government council office in Anambra state. Upon returning, the researcher adjusted the closed-ended and open-ended questions, in consultation with his principal supervisor. The final questions were used to gather data during the main fieldwork. The researcher carried out the pilot study between December 2013 and January 2014. This initial study was to ascertain the various hazards that affect the Southeast region of Nigeria. To do this, the researcher had to travel to the five states that make up this region of the country – Enugu, Anambra, Imo, Ebonyi and Abia states. During this pilot study, the researcher travelled from state to state, to see the issues on ground and try to interview at least one member of a randomly selected community within each state. While the researcher spent plenty resources to undertake the pilot study, it was important as it helped the researcher understand what had been captured in the literature on the hazards affecting communities in South-East Nigeria (Table 3.5). The hazards affecting the Southeast region are erosions, landslides, oil spillages, conflicts and the menace of bad roads.

Table 3.5: Hazards affecting different communities in states of South-East Nigeria

STATE	COMMUNITY/COMMUNITIES VISITED	NUMBER OF RESPONDENT(S)	HAZARD IN COMMUNITY
Anambra State	Ekwulummili (in Nnewi South LGA)	3	Erosion Flooding
	Nimo (in Njikoka LGA)	3	Landslide
Imo state	Isiama (in Isiala Mbano LGA)	3	Bad roads
	Orji (in Owerri North LGA)	3	Flooding
Abia State	Owaza (Ukwa West LGA)	3	Oil spillage
	Logbanta (Aba North LGA)	3	Soil erosion
Enugu State	Abakpa Nike (Enugu East LGA)	3	Conflicts
	Nru (Nsukka LGA)	3	Flooding
Ebonyi State	Nkalagu (Ishielu LGA)	3	Bad roads
	Onueke (Ebonyi South LGA)	3	Erosion
TOTAL NUMBER OF RESPONDENTS		**30**	

Source: Author

The main purpose of the pilot study was to develop a hazard profile of the hazards and disasters that affect communities in Southeast Nigeria and how such communities handle them. In 2007, the Nigerian government submitted a document to UNISDR on the implementation of the Hyogo Framework of Action (HFA). The document highlighted various hazards that affect states in Nigeria and the government's working plans on fixing the problems. Hazards and disasters in the Southeast states of Nigeria included oil spillages, floods, conflicts, erosions and landslides that have affected various communities (PreventionWeb, 2007). The researcher carried out the pilot study by going to random communities that made up the states in the Southeast of Nigeria. The researcher made enquiries about hazards from members of the community who had the patience to talk to him briefly. The researcher is from Anambra state, which led to the researcher starting the pilot study there. It was easy to get respondents from both communities in the state represented in the pilot study. From Anambra state, the researcher headed to Nsukka in Enugu state. The research is focused on Nsukka and its environs. The researcher had temporary residence in Nsukka as he was getting ready to carry out an ethnographic study in the community. One of the respondents from Nru in Nsukka was a store owner whom the researcher patronised regularly. This respondent also helped the researcher locate

two other people who became respondents. An unsuccessful visit to NEMA (National Emergency Management Agency) zonal office in Enugu town aimed at gaining information on its role in DRR in the Southeast region, led to the interviews obtained from Abakpa Nike community. To obtain interviews in Ebonyi state, the researcher had to spend a weekend in the state. A journey of five days across Abia and Imo states led to the obtaining of interviews in communities in these states. Some important demographic characteristics were taken into consideration during the pilot study. The age, sex, occupation and level of education were noted during the pilot study. The age limit for the respondents was between 30 to 50 years. For every community in the different states, a man and a woman were interviewed (Table 3.6). The assumption in the study was that a member of the community who has lived in a community for 10 years or more would know the hazards and disasters that affect the community.

Table 3.6: Characteristics of respondents in pilot study

Gender	
Male	18
Female	12
Age group	
30-40	11
40-50	19
Occupation	
Private business	4
Farmer	13
Government employee	10
Private employee	3
Level of education	
Primary school	7
Secondary school	16
University	7

Source: Author

The age group of the respondents show that 36.7% were between the ages of 30 to 40 while 63.3% were between the ages of 40 and 50. From the outcome of the pilot study, it is seen that communities in the Southeast region of the country experience a host of hazards and disasters, as has been documented in recent years. The pilot study prepared the researcher for the next step in the research process, shaping his mind towards understanding the requirements and challenges involved in carrying out a research. A pilot study is necessary for researchers as it provides a platform for analysing the conditions at the intended study area, evaluating the feasibility of the study, costs and requirements for the study. It provides early warning and helps prepare the mind of the researcher towards the challenges which might be encountered in the main study (van Teijlingen and Hundley, 2002). To be able to gather data for the main study, the researcher had to go to the field and reside in the study area. One of the key methods used in the research is ethnography, which requires the

researcher to reside within the area of interest over a period. This enables the researcher to observe how things are done in such a location and gather data (Brewer, 2000; pg. 10). Data collection is the most important aspect of research. Conducting interviews is the ethnographer's strategy for getting direct views and important data. Interviews may be structured or semi-structured, depending on what goals the researcher aims to achieve with the study (Murray, 1998; Fetterman, 2010). Structured interviews are closely related to questionnaires that are used in conducting research. The difference between questionnaires and interviews however, is that when using questionnaires, the researcher and the respondents are not together at a setting. Interviews create this interactive platform that is missing in the use of questionnaires. Although it is argued that the use of questionnaires may lead to misinterpretations, they are excellent in enabling researchers in the field trying to obtain valuable data from specific representatives relates to a research (Fetterman, 2010).

3.6.3: Closed-ended Questionnaires:

The questions that make up questionnaires can take two different forms; the questions can be open questions or closed questions. Open questions require the respondents to use their own words when giving answers to the questions. Open questions give the respondents the ability to answer questions from their own perspectives and not from the pre-determined perspective of the researcher. However, due to different responses from respondents, the answers can be difficult to interpret and compare. On the other hand, closed questions require the respondents to answer the questions in a format that has already been selected by the researcher. Closed questions are straightforward and yield more reliable answers than can easily be standardised and analysed. The disadvantage of these types of questions is that they do not give the respondents chance to express themselves (Fink, 1995). For this research, two sets of questions were developed. The open-ended questions were used for conducting in-depth interviews that required the researcher to sit down with the respondents and gather data through the information provided by such respondents. The closed-ended questions were developed and handed out to individuals to obtain quantitative data that was statistically analysed. These closed-ended questions also helped in the gathering of information about people's perception to the issues of DRR in Nsukka, Enugu and the South-East region of Nigeria, as they were distributed to a wide range of respondents. To ensure proper distribution of the closed-ended questionnaires, the researcher used a purposive sampling method to give out the questionnaires. These questionnaires were distributed to respondents from different states living in Nsukka. The reason for giving out these questionnaires to diverse respondents was analyse the differences or similarities in perceptions to the issues of hazards and DRR.

3.7: Realist Epistemology and Methods:

Realism has been described as the ontology of 'common-sense' (Outhwaite, 1987; Putnam, 2016). It is concerned with the existence of things, structures and mechanisms in the real world. Realism tries to categorise a statement as true by confirming it is true. This philosophical approach has been accredited to Roy Bhaskar and it combines the notions of the general philosophy of science (which argues beyond realism) and the philosophy of social science (critical naturalism) (Bhasker, 1978). However, the term 'critical realism' was coined by Roy Wood Sellers in 1915, as his own approach to scientific materialism which opposes the notions of idealism and pragmatism. This approach to the philosophy of science is based on the belief that some reality exists which is independent of our knowledge and not part of our descriptions, but we get to find out about this other world through specific inquiries. What this means it that the real world out there can render a perceived world to be true or false (Dummet, 1982; Ouhwaite, 1987). Realism, also known as critical realism, is a philosophical stance that is based on the belief in the existence of different realities. It argues that each reality has each own distinct characteristic, properties, power of influence and tendencies. Realists argue that the interplay between the components of these different worlds lead to the emergence of another new world. From a realist perspective, the way we define the world and its

functioning influences how we gather knowledge about the world (Trigg, 2001; Danermark et al, 2002; Reed, 2005; Reed, 2009). The arguments of critical realists go back to the ontological and epistemological paradigms of the philosophy of science. The views we have of the world should not be dependent on the principles that we use to define the world itself. Different forms of realism have been advocated for in research. Some of these include critical realism (Bhaskar 1989), experiential realism (Lakoff, 1987), constructive realism (Howard 1991), artful realism (Shweder, 1991), subtle realism (Hammersley, 1992), emergent realism (Henry, & Julnes, 2000), natural realism (Putnam, 1999), and innocent realism (Haack, 1998). Such variety of realism led Leplin (1984) to proclaim that *'scientific realism is majority position whose advocates are so divided as to appear minority'* (Leplin, 1984: pg. 1). These approaches to realism have influenced the philosophy and methodologies that are applied in carrying out social science research (Cook & Campbell, 1979; Lakoff, 1987; Campbell, 1988; Bhaskar, 1989; House, 1991; Shweder, 1991). Despite the variations in these approaches, they all share two common principles. The first is that they all agree that there is no single and ultimate understanding about the world; all theories about the world are based on a perception, which means knowledge can be wrong. The second common principle is that the various approaches to realism accept the notion of 'cause' and 'effect' (Maxwell and Mittapali, 2007).

A different approach to realism is critical realism, which gives the most in-depth adaptations and insights into the importance of realism for research methods; scholars like Pawson & Tilley (1997) and Sayer (2000) have elaborated the concept to benefit researchers better. Even so, the number of scholars who have delved deeply into its importance in carrying out qualitative research is low. It is argued that critical realism provides a logical approach in carrying out qualitative research, leading to positive outcomes in such research. Critical realism emerged through the works of Roy Bhaskar in the 1970s. This approach to research is a methodological stance that is not based on any predetermined methods. Critical realism argues that what we humans identify as 'reality' is a very minute part of what the main 'reality' is. Critical realism proposes that there are many theories in the world but that these theories do not determine the real world (Fletcher, 2016). While the critical realism approach to research does not deny that knowledge can be gathered in the real social world through the application of philosophy, it highlights that some knowledge says more about reality than others (Danermark et al, 2002). Critical realism helps in the understanding of social phenomena and such understanding can help inform judgements. Critical realism is a valuable tool for social research as it aims to understand the cause of such social phenomena (Archer et al, 1998; Fletcher, 2016). Critical realism highlights three levels of reality: the empirical level of reality (explaining phenomena using 'common sense' and human interpretation), actual level of reality (the occurrence of events different from human interpretation and not influenced by human interpretation) and the real level (the factors and mechanisms that influence the occurrence of phenomena to produce the events identified at the empirical level) (Danermark et al, 2002; Fletcher, 2016). Realism influences qualitative research methods and methods of data collection such as in-depth interviews, focus group interviews and ethnography.

3.7.1: Ethnography:

Ethnography, in research, is not just a word which signifies a method. It is a method that involves the utilization of a range and variety of methods (O'Reilly, 2005). Ethnography has been defined from different perspectives that may be significant to a researcher, depending on the context in which the research is being conducted. Brewer (2000) refers to 'little' and 'big' definitions of ethnography. He argues that ethnography from the 'little' definition is lay knowledge of the term to signify just fieldwork research. For him, ethnography is employing methods in research that capture simple and everyday activities of a people in an ordinary setting, to apprehend the social meaning of these activities. It involves the researcher participating directly in this ordinary setting to systematically obtain data but at the same time, avoid encroaching on the people (Brewer, 2000). Years before this definition, several scholars had unconsciously given the definition of ethnography from only this 'little' perspective of Brewer (2000). Watson-Gegeo (1988), following the definitions of Firth (1961)

and Hymes (1982), defined ethnography as a study that aims to gain an understanding of cultural behaviours of individuals in a naturally occurring setting. Aull (2008) writes that ethnography is research that exploits various qualitative research methods, such as the extended study of the lives of individuals in a community. The 'big' perspective of ethnography represents general qualitative research and any methods that does not use surveys in the obtaining of data. In viewing ethnography from this angle, ethnography becomes a way of undertaking qualitative research. This way of undertaking research utilizes the use of unstructured and unrestricted methods (Wolcott, 1973; Burgess, 1982; Brewer, 2000). Although some authors argue that the complex use of various methodologies in ethnography and its applications in various fields that range from sociology and anthropology, to geography and psychology, has resulted to the situation where there is no concrete definition of the term (Hammersley and Atkinson, 2007). However, O'Reilly (2005) tried to define the term, covering Brewer's (2000) postulation of 'little' and 'big' ethnography and presenting a broad definition. She defines ethnography as basic research that uses a variety of methods that involve direct and continuous contact with human subjects within their everyday live situations, observing scenarios, listening and asking questions, to reproduce a rich written detail of the experience that recognises the roles played by theory, the human subjects and the researcher (O'Reilly, 2005). Ethnography originates from the field of anthropology, where it involves observing behaviours and participating in a specific setting (Neyland, 2008). The history of ethnography dates to Western anthropology in the nineteenth-century, when it represented any detailed report of a community or culture that does not lie in the part of the world referred to as the 'West' (Hammersley and Atkinson, 2007).

The term 'ethnography' had been confused with 'ethnology', which means 'historic and comparative' analysis of non-western societies and cultures (Hammersley and Atkinson, 2007). Ethnology was based on accounts given by missionaries and travellers. These individuals were delighted to gather exotic descriptive information, as well as relics from the civilizations they encountered (Banton, 1977); anthropologists who analysed such information and evidence brought back by these missionaries and travellers were only involved in theorizing, as they were not in the field themselves. However, the early 1900s saw anthropologists such as Malinowski (1960) argue that ethnographic information documented by such missionaries and travellers was information from non-experts. Malinowski and other academics began discussing the idea of going out into the field and gathering this information themselves (O'Reilly, 2005; Malinowski, 1960). Hammersley and Atkinson (2007) describe ethnography as a study that involves studying people's behaviours and their accounts of details in day-to-day scenarios. In doing this, there is no limitation in data collection, as is otherwise the case in an experimental order of research that follow highly structured formats. There is no specified design of ethnographic research; the interpretation of information obtained is generated during data analysis.

3.7.2: Ethnographic Methods:

Methods represent strategies used in gathering data. Ethnography utilises several methods for obtaining data. Data collection is at the core of ethnography as it involves the researcher participating in people's lives over a period. The researcher does this by being attentive to every situation, observing occurrences, listening to people and asking questions formally or informally and by gathering any documents or materials that relate directly or indirectly to the research. It is important to mention that ethnographic methodology covers two research approaches: non-participant and participant observations. Non-participant observation is where the researcher observes and monitors the activities of research subjects from a distance, ensuring that there is no interaction between the observer and those being observed. This method is usually used where there is a risk that the interaction between the observer and those being observed would lead to a change in the behavioural patterns of the observed. Participant observation, however, involves a direct relationship between the observer and the observed subjects. The researcher resides within the research environment; this research environment is the field. The researcher interacts with the subjects and participates in their

daily rituals, while learning to comprehend the meanings of their everyday actions (Giampietro, 2008). This sort of research involves working with individuals in their community for a period. It is important that a researcher understands the people under study and utilize an unstructured approach to research, in order not to isolate the relevant individuals required to make the study a success (Fetterman, 2010). Malinowski (1960) argues that scientific fieldwork aims to portray the characteristics and culture of a social settlement, to describe how everyday life is carried out in this social settlement and to garner data from the individuals that constitute this social settlement. The researcher obtains data from one source or a host of sources. Data can come from informal or unscheduled conversations and participant observation. The data collection, being in an unstructured form, does not demand that the researcher follows a fixed, specified process (Given, 2008; Lee and Fielding, 2004). An ethnographer does not follow any laid-down strategy or method of data collection that is unchangeable or fixed; he/she develops an appropriate method of approach that is best for the study and applicable throughout the research (Neyland, 2008). The data comes from various sources which include documented accounts from individuals through informal and unstructured discussions, and by participant observation (Lee and Fielding, 2004; Hammersley and Atkinson, 2007).

3.7.3: Participant Observation:

Participant observation is the main method employed in ethnographic studies (O'Reilly, 2005; Brewer, 2000) and it involves participating in the everyday activities of a study group over a prolonged period (Evans, 2012). The participant observation method is backed by the concept of symbolic interactionism, an approach developed by Herbert Blumer (1900 – 1987). He argued for the 'naturalistic' approach to social research, an approach that involved going into the field to observe reality and gather views of the social subjects (Blumer, 1986). Principles of interactionism include gathering views of study group, studying modes of interaction, analysing processes and understanding the meanings of actions that arise from behavioural patterns. It also enables the abstraction from narrative to theory (Giampietro, 2008). Participant observation refers to the methodology used in fieldwork when undertaking an ethnographic study that includes all formal and informal approaches and observations (Spradley, 1980; Agar, 1996). It is one of the methods used in fieldwork, which involves participating in community while observing behaviours of individuals within the community, then writing down all gathered information (Dewalt and Dewalt, 2002). This is carried out by observing the individuals, talking to them, and then deciphering the meanings of gathered information (Brewer, 2000). It is not a single research method but a research strategy that is made up of different methods, which may include focus group interviews and discussions, as well as informal approaches (Moffatt, 1979). It involves the social interaction between a researcher and individuals in their natural surroundings, which leads to the systematic generation of data (Taylor and Bogdam, 1984). The purpose of participant observation is to obtain an in-depth understanding of a situation by how it affects the individuals who experience and live with this situation. The method is appropriate in undertaking research that tackles social phenomena where little study has previously been carried out (O'Reilly, 2005; Given, 2008). It excludes any form of selective understanding of individuals of a community. The act of fitting into a different culture, different from the cultural origins of the researcher, over a period, ensures that the researcher does not concentrate only on one aspect of this different culture but tries to understand all aspects that make up this culture (Picchi, 1992). In carrying out a participatory observation in ethnographic research, some important components determine how successful the research will be. The first is gaining access to intended respondents in the community or locality where the ethnographic research will be undertaken. The step of gaining access while carrying out a research is not just a one-off thing; it is very important throughout the research process, as data collection and the analysis of such data still involve access (Hammersley and Atkinson, 1995).

Although some researchers conduct research within their own circle or locality, most ethnographic researchers travel off to 'foreign' environments to conduct their research (O'Reilly, 2005). Due to this, there is always that initial sense of being a stranger in an unknown place and because members of communities may not understand the principles that constitute a participant observation study, the researcher may feel like a spy within this unknown territory (Rock, 2001). Gaining access in participant observation when conducting an ethnographic research is difficult because as a researcher, there are places where one cannot enter due to factors such as race, sex, age bracket, social status, research subject and skin colour. The researcher may never be trusted (O'Reilly, 2005). As a researcher, however, one should use common sense and a personalised strategy in carrying out research. A way of going about issues like these is deciding from the onset, how overt or covert the research will be and by going through individuals known as gatekeepers. A gatekeeper is an individual who has some influence in a research setting, to grant access to a field or respondents (Berg and Lume, 2004; pg. 24). In conducting an overt research, the researcher is open to all participants, keeping all aspects of the research open to all; in conducting a covert research, the researcher withholds some aspects of the research from participants due to reasons best known to him/her, reasons that may include race, ethnicity and sexuality for example. The problem with this however, is that some individuals in the community may look at a researcher as a spy (Karp, 1980; Hammersley and Atkinson, 1995; Ezeh, 2003). Those concerns of the members of community can become justified. It is advisable that when trying to gain access and conduct a participatory observation in ethnography, the researcher should first make his/her aims completely known to the participants in an overt manner at the introductory stage of research; then after that, conduct the core of the research in a semi-overt manner. By conducting the research this way, the participants know that the study is taking place and understand what the study involves. They are not seriously bothered, as the study does not infringe on their daily activities or routines. Spending time within the community is also important. When the members of the community see a researcher for a longer period, they tend to relax more and come to accept the researcher as a part of their society (O'Reilly, 2005).

It is argued that the most crucial factor in an ethnographic study is not just spending a long time in the field; it is ensuring that the work is done within the period when data which relates to the topic of the study will flow (O'Reilly, 2005). While some people would raise eyebrows when an ethnographic study is conducted within a very short participant observation period in the field, they will still value such a study due to its contribution to a specific area of knowledge (Hicks, 1984). Successful ethnographic researches may or may not necessarily take very long time; it depends on how the study makes important contributions to knowledge with its rich output. Ethnography can be conducted in almost every location and setting. However, gaining access to any ethnographic location is just one step of the 'access' process. Different settings mean that diverse ways of approaching the field should be developed. To ensure that there is a total, uninterrupted access in the field, there is a need to develop field relations in any given field. There are no set rules or procedures in creating field relations, as ethnographic fields are different from each other (Hammersley and Atkinson, 2007). Building field relations is dependent on a range of factors, such as trust, a balance between what is expected of the researcher and what the researcher intends to do, and finding a balance between being an expert on a subject and being a novice on same subject in the local communities (Hammersley and Atkinson, 2007).

3.7.4: In-depth Interviews:

Qualitative interviews rose to prominence in the early 1980s. They were regarded as favourable, personal and dialogical alternatives to the quantitative positivist approach to research. These interviews provide a platform where the respondents are engaged in dialogue and not just treated as objects of research. Qualitative interviews are progressive and are important in drawing out credible information on issues that affect all aspects of life. It creates a platform for everyone, even the most marginalised, to make their opinions heard (Kvale, 2006). While the concept of 'dialogue' in qualitative interviews may be misleading, it is important to understand that 'dialogue' used in this context refers to the exchange of conversation – the researcher asks questions and the respondent gives answers or explanations. In-depth interviews are one of the most dependable methods of gathering data for a qualitative research. This approach to gathering data helps in getting the views and perceptions of the interviewees, which is important for the research. It is a method of data collection that has been favoured by ethnographers, as well as other qualitative researchers over an extended period. It has been described as a form of conversation with a purpose (Legard et al, 2003). An in-depth interview is a qualitative research method, which involves conducting individual interviews with respondents, in other to gather information about a phenomenon or occurrence. Not only does it help in understanding the perceptions of people, it is also valuable in capturing developing issues (Boyce and Neale, 2006). In-depth interviews have various distinct characteristics. To conduct in-depth interviews, a researcher should develop open-ended questions. Open-ended questions are worded in a way that respondent discusses an issue, and not just answer 'yes' or 'no' (like in closed-ended questionnaires). Open-ended questions could begin with 'how', 'what is' or 'why'; this makes the respondent explain an issue, rather than limit the response to one word. Another characteristic of in-depth interview is its semi-structured format. Although it is important to develop the questions for interviews beforehand, these questions could lead to other questions during the interviews. The researcher tries to understand the answers given by the respondent(s) to each question. To be able to keep data for transcription, the interviews are recorded (with the consent of the respondent) and field notes are also kept (Guion et al, 2001). For in-depth interviews to be successful, the researcher should be open-minded and should not make any judgements or criticisms that may hinder the progress of the interview. The researcher should be patient and be a good listener, as this makes the respondent feel at ease and comfortable in providing information to the researcher. A researcher should also be flexible, observant and responsive (Guion et al, 2001).

There are two types of in-depth interviews. The first is the one-to-one interview and it is a situation where the researcher interviews one individual, to find out his perception on specific issues or phenomena. A second type of in-depth interview, known as the focus groups interview, is concerned with trying to understand how a group of individuals interact and respond to issues (Fielding and Thomas, 2008: pg. 251). One-to-one interviews make use of open-ended and flexible questions to capture the viewpoints of the respondent. This gives the respondent a platform to give his or her own account about issues or phenomena, using his or her own language and could allow the researcher to be taken into uncharted territories in specific issues. One-to-one interviews are recorded, with the researcher also taking notes and making observations about other related issues like body language (Henn *et al*, 2009: pg. 188 and 189). Interviews held with a group of respondents in a setting are known as focus group interviews. Such interviews are carried out to find out the opinions and perceptions of respondents, not on individual basis, but as a group. These interviews allow the respondents to engage with each other and debate specific issues or phenomena. The individuals that make up the focus group must have something in common; what they have can range from having experienced a situation together, to being market women or a specific social class. To be able to select the members of a focus group, some form of theoretical sampling must be employed to ensure correlation (Henn *et al.*, 2009: pg. 190). The role of the researcher in in-depth interviews is very important. The researcher is the one who is competent enough to conduct the interview situation. The researcher develops the questions, initiates the interview, does a follow-up on the answers obtained and ends the interview. The researcher asks the questions while the respondent replies. In an interview situation where the respondent becomes the one asking the questions and the researcher ends up being

the one answering the questions, the research data may not be credible (Kvale, 2006; Henn *et al*., 2009).

It is common for researchers to use a bit of manipulative edge to obtain answers. In this context, the researcher tries to get information from the respondent without their knowledge by asking indirect questions, which end up giving the researcher what he or she had at the back of their minds (Kvale, 2006). Critics of qualitative interviews have argued that this method to research may be exploitative and manipulative. It has been argued that since qualitative interviews take place when trust and empathy has been used to impact confidence, the interview process involves manipulating respondents by 'pretending to be interested' in the respondents' situations. Researchers may also end up creating personal relationships with the respondents to finish the research on time. This goes against the ethics of research. They also argue that because the researcher shares a kind of closeness with the respondent, the research ends up being subjective and does not have a strong scientific base (Burman, 1997; Mauthner et al, 2002; Henn et al, 2009: pg. 187). For this research however, the researcher went into every interview situation with an open mind. While it was impossible not to build acquaintances with some respondents, the researcher ensured that such associations did not influence the outcome the research in any way.

3.7.5: Research Ethics:

In carrying out research, the researcher should not only aim to gather data. The researcher is also tasked with the responsibility of looking after the respondents or research participants, while ensuring that the research is carried out in a way that sensitive to the rights of others (Bulmer, 1982: pg. 3). This sensitivity to the rights and feelings of others involved in the research is known as ethics. It helps in the protection of individuals, local communities, animals and the environment. It is the responsibility of researchers to reduce or eradicate conditions, which may lead to the harm of individuals, animals, communities and environment on the long run. Carrying out research ethically ensures that trust is built between members of the research community and researchers (Israel, 2015: pg. 2). Ethics has been described as '*a generic term for numerous ways of understanding and examining the moral life*' (Beauchamp and Childress: pg. 4). Ethical considerations have come to the forefront of research as social researchers conduct their activities in various settings, conditions and environments. While various researches may employ different approaches and the researcher's use personal approaches for gathering information, ethical considerations influence the way researchers obtain data. Social researchers must carry out research in a moral manner and should view ethics as a legal requirement when carrying out research. Various institutions and organisations have their guidelines for ensuring that researchers carry out ethical research. However, there are basics that cover what ethical considerations should be. Researchers should be impartial in the gathering, analysis and distribution of information. It is important to carry out research morally and not just in a way that pleases the sponsors of a research project or one's self. The integrity, safety and rights of those being researched must be upheld throughout the research. The researcher must ensure that the intended respondents are providing information voluntarily and are not forced to do so. The intended respondents to a research should not be offered incentives to take part in a research, as this may lead to bias in obtaining data (SRA, 2003). For this research, the researcher was required to submit an outline of the research during his first year of the research. This required the researcher to provide a description of the research, the intended participants, the environment and locality where the research would be taking place, and all other necessary information. This was submitted to the Research Ethics Committee of the university. The researcher was also required to go through a checklist provided by the committee before approval was to be given to carry out this research. The committee approved the research on the 9th of July 2014.

3.7.6: Informed Consent for Interviews:

Various components come together make research ethical. One of the most important components in social research is ensuring that respondents give consent to the research. It is a process where the respondents learn what the research is all about, the key themes of the research and the advantages (and in some cases, disadvantages) of the research. Only after the respondents understand these can they decide to participate or not participate in the research (Nnebue, 2010). Informed consent is not just a part of research, it is a legal requirement in carrying out research, as it ensures the respondent knows about the risks, benefits and all other components that relate to the research. The intended respondents must have the choice to agree or disagree to participate in a research. The intended respondents to the research must voluntarily give consent (Wagner). Three core elements for informed consent have been identified – information, comprehension and volition. The respondents must be provided with all information that relates to the research work. After the intended respondents have been provided with the information about the research, the researcher should ensure that these intended respondents understand all aspects of the research, what is required and what the research aims to achieve. After this, it should be ensured that the intended respondents give their consent out of their own free will before being interviewed (Wiles et al, 2005; Nnebue, 2010). The process of informed consent in research looks direct and it seems it does not require any specific set of skills or many requirements. However, it is a lot deeper than it seems at first glance (Alderson & Goodey, 1998). It is argued that the concept of informed consent, which requires that all aspects of the research be explained to the intended respondents, is not entirely truthful. The point given for this argument is that with the limited time available for the researcher to explain the complete research to the intended respondent, it is quite impossible for the intended respondent to totally comprehend the consequences of the research. A researcher starts up a research to make discoveries. The pressure on the researcher to ensure that results are duly obtained could make researcher provide the intended respondents less information about the research or give the intended respondents 'gifts' to encourage participation. Such strategies are not ethical for research and may influence the information and data obtained (Homan, 1991). Researchers need to provide adequate, sufficient information to the intended respondents to allow them to decide if they are interested in participating in the research, without being influenced by any factors (Wiles et al, 2005).

Informed consent requires written and oral provision of information to the intended respondents. This information should not overwhelm them as this might cause confusion (Alderson, 2004). In developing the written consent, the researcher should ensure that the language used in the consent does not sound very official. It should be written in a plain, easily understandable manner (Truman, 2003). It has been argued that researchers conducting ethnographic studies may intentionally or unintentionally withhold all the information about such research (Mulhall, 2003). Some argue that it is better not to explain all aspects of the research to the intended respondents as this might change their approach to interviews, hence causing a bias in data obtained (Homan and Bulmer, 1982). However, it is very important that the researcher finds a balance in how information about the research is shared with intended respondents (Wiles et al, 2005). For this research, the researcher developed a two-paged informed consent form, which he carried along with him to every interview section. This informed consent form introduced the researcher, his research and made provision for where the intended respondent could agree or disagree to take part in the research. The informed consent form was not limited to the in-depth interviews. For the closed-ended interviews (questionnaires), the researcher also provided the intended respondents with copies of the informed consent forms, which they needed to understand before providing information.

3.8: Data Analysis:

After gathering data, the next step involves analysing the data. Analysing data involves interpreting gathered data in a way that leads to finding the information within the data, and making sense of such data (Whittaker, 2009). It involves the translation of raw data into variables that produce information (Swift, 2006; pg. 153). Before analysing data, the researcher should keep in mind how the data was collected while deciding how the collected data would be categorised, the type of analysis that would be required for each set of data, methods to use in the analysis and the available resources available for the analysis. Throughout the analysis process, the researcher must always bear the research aims and objectives in mind (ibid. pg. 155). For this research, quantitative and qualitative approaches were used in the data collection process. It follows that a mixed method approach should be used in analysing the data obtained. It has been argued that quantitative and qualitative data can be linked and combined in a way that produces a concrete data set. In this regard, qualitative data could be converted into quantitative data for research purposes, and vice versa (Caracelli and Greene, 1993). For this to be successful however, it is important that the researcher use qualitative techniques to analyse qualitative and quantitative data, or use quantitative techniques to analyse qualitative and quantitative data. Methods such as narrative analysis techniques are used to analyse interview data, while questionnaires may involve the use of statistical analytical techniques. Combining the outcome of the qualitative analysis of qualitative data and the outcome of quantitative analysis of quantitative data is done at the interpretive stage of the research (Sandelowski, 2000). 'Quantitizing*'* is a term used to describe the transforming qualitative data into quantitative data, while 'qualitizing' is a term used to describe the transformation of quantitative data into qualitative data (Tashakkori and Teddlie, 1998; pg. 126). The use of these methods leads to more information being obtained from the research data (Sandelowski, 2000).

For this research, the researcher leaned more towards the use of 'qualitizing' as the analytical tool in making sense of the data gathered throughout the research process. Analysing the data this way leads to the entire results and findings being represented in a narrative form. Narrative, as defined by Hinchman and Hinchman (1997) are '*discourses with a clear sequential order that connect events in a meaningful way for a definite audience and thus offer insights about the world and/or people's experiences of it*' (pg. 16). Interviews provide most data in qualitative research. Interviews vary from in-depth, semi-structured and standardized survey interviews; these interview styles still fall under qualitative methods. Referring to the philosophical stances of this research, it is important to remember that the qualitative aspect of the research is based on realist assumptions. Qualitative interviewing helps to understand the underlying realities that influence people's lives (Weiss, 1999; Elliot, 2005; pg. 19). Combining realism and narrative, it is observed that both are interested in finding out people's experiences on the significant issues which influence everyday life; hence, an adoption of a narrative form of analysis for qualitative data in this research, known as narrative analysis. Narrative analysis focus on the 'content' of stories or the 'meaning' of stories (Polkinghorne, 1995). It is important to mention that the narrative method of analysis is not limited to qualitative research, as quantitative narrative analysis involves the presentation of data in a way that allows for statistical analysis of data (Franzosi, 2014).

3.8.1: Using software in Data Analysis – Nvivo

Analysing research data could be demanding and take a long time to analyse. Trying to make sense of data and bringing out the important themes could be strenuous and repetitive. Analysing data requires critical thinking, creativity and an ability to theorise (Basit, 2003; pg. 143). Different software packages are available for researchers to use in the analysis both qualitative and quantitative data. The use of software in qualitative data analysis can shorten the amount of time required for analysis, while also helping in the coding and interpretation of data (Jones, 2007). The use of digital mechanisms, such as employing software in carrying out human work, has been criticized in various circles. The argument is that data could be made impure by the ease of manipulation of software (Crowley et al, 2002; pg. 193) and could also create a divide between the researcher and the research (Welsh, 2002).

However, it is important to note that software can help researchers manage and organise their data, to ensure better results. They provide flexibility, transparency, comprehensibility and accuracy in analysing and reporting research data (DeNardo and Levers, 2002; Welsh, 2002). It is important to mention that the computer software do not carry out data analysis for the researcher; they only ensure that the mechanical process of analysing data is more organised (Bourdon, 2002). One of the software used in data analysis is Nvivo. This software assists qualitative researchers in the analysis of data. Substantial amounts of data could be managed easily, and the software ensures the easy coding of data. The software helps in categorising data and creating nodes; the nodes could be easily adjusted and reshaped to fit the emerging framework of the data (Jones, 2007). Nvivo allows for editing and the ability to add comments and attributes to data in the software makes it easy to incorporate quantitative data, which leads to better results. The software is also easy to learn, use and understand (Richards, 2002; Jones, 2007). For this research, the researcher used the software at the initial stages of data analysis. The reason why the researcher used the software was to save time in the data analysis process and since the data from this research came from various sources, the software helped in the organisation, presentation, coding and the development of emerging themes out of the qualitative data.

3.8.2: Data Coding:

Data analysis is a demanding aspect of the whole research process. This is the stage of the research where the researcher tries to make sense of all the information that has been obtained throughout the research process. The researcher must understand the gathered information and interpret such information to give results. While raw data can throw a lot of interesting information at the researcher, it does not provide any useful understanding on how the perceptions of the participants influence the research unless such data is coded (Basit, 2003). For data to be meaningful in research, it must be organised into categories through a process known as coding. It involves the use of codes to give meaning to descriptive language in data. They are attached to portions of the data texts and may determine a category, which goes a long way towards identifying the themes that begin to originate from data (Dey, 1993; Miles and Huberman, 1994). Data can be coded electronically and is innovative for researchers, especially in qualitative studies (Basit, 2003). For this research, the use of NVivo software as an aid in the analysis of the qualitative data required that the researcher carry out the coding within the software and data, to avoid any external influence that could alter the research data.

3.9: Limitations and Challenges to the Research Methodology:

The use of software for data analysis has its disadvantages. Using research software leads to rigidity of the data and distracts the researcher from the real progress of data analysis (Winsome and Johnson, 2000). In analysing semi-structured interviews, the researcher observed that the responses that matter to the research were not given by some respondents after a specific question was asked. An important response might manifest somewhere else within the interview. Nvivo software may limit the researcher's ability to capture important answers and developing themes because as researchers may tend to search for specific answer patterns, they might miss the important answers within the complete interview response. This situation was experienced by the researcher and he reverted to manually transcribing his interview data after some time. The researcher realised that while some respondents did not give direct answers to specific questions, the answers appear later in the discussion between researcher and respondent. Looking for specific answers and going back to input them into specific nodes in the software made the analysis disorganised, hence the researcher decided to do the analysis manually. Although the manual method took a longer period, it ensured that the researcher captured all the essential responses with each interview.

3.10: Conclusion:

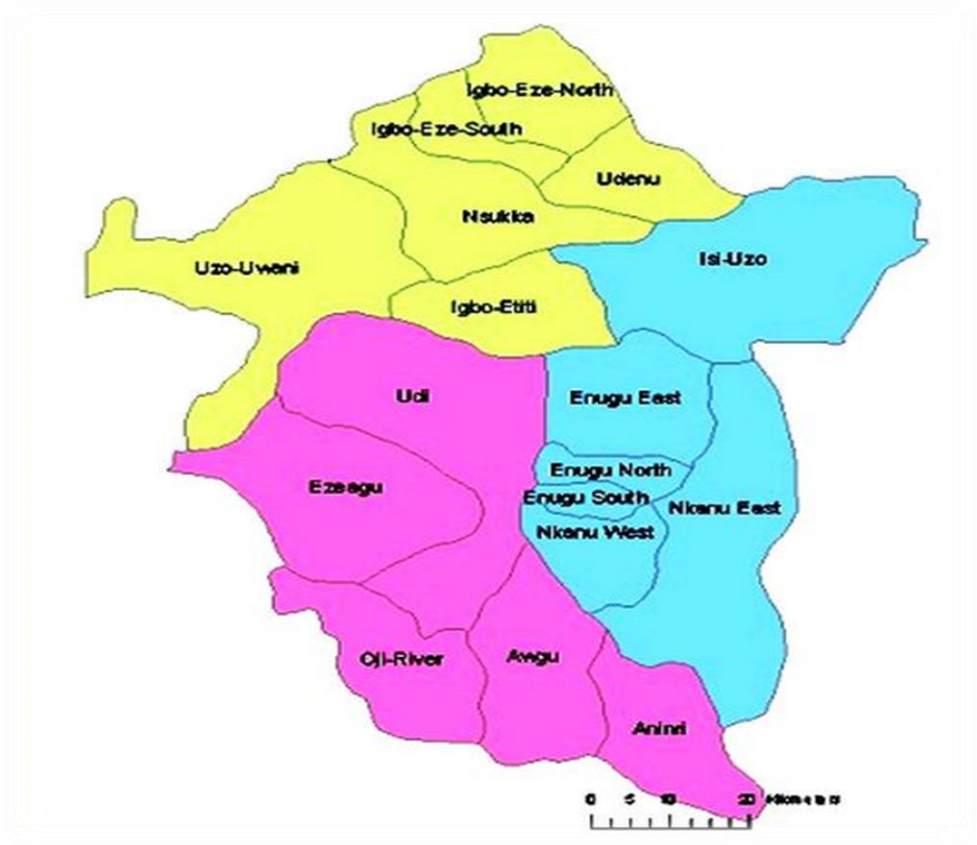
This chapter has tried to present the methods used to obtain data in this research. It presented the importance of a pilot study in research and how the pilot study prepared the researcher for the main study. The origins and philosophical backings of these methods have been presented. No research approach or method is adequate for research, as every method has advantages and disadvantages; what is important is that any method used should provide the researcher with the tools to gather the necessary information related to the research. The researcher has chosen the research methods presented in this chapter as he believes these methods would help in the generation of data which would answer the research questions. The next chapter highlights the different hazards and disaster that occur in Nigeria and their impacts. The chapter then tries to present the hazards and disasters that have affected Nsukka communities in the past, as gathered from available literature.

4.0: THE STUDY AREA

4.1: Overview of Enugu state:

The research is based on the South-East region of Nigeria, with focus on Enugu state. The name of the state 'Enugu' is based on the Ibo translation 'Enu Ugwu', which literally means 'On top of the hill'. The state was created out from its neighbouring state, Anambra, in 1991 under the dictatorship of General Ibrahim Babangida, with the city of Enugu as its capital. The first European settlers used the town itself as its base to reach the South-East region of Nigeria in 1909. The search for silver by European settlers led to the discovery of large coal deposits in the area; hence the motto of the state, which is 'coal city state'. Enugu state shares borders with Anambra, Imo, Benue, Kogi, Ebonyi and Abia states of Nigeria. The 2006 Nigerian census put the figure of residents of Enugu state at over 700 thousand. The state is made up of 17 local government areas (Figure 4.1).

Figure 4.1: Map of Enugu state, showing the various local government areas



According to a report sent to the United Nations, in relation to the implementation of the Hyogo Framework for Action in Nigeria in 2007, Enugu state suffers from the impacts of various hazards and disasters. Some of these disasters include pipeline explosions and fires, landslides and windstorms (UNISDR, 2007: Nigerian National Report). Other hazards and disasters that occur in various local governments of the state include pollution, erosion and flooding. Local communities in Enugu state have always been vulnerable to various hazards. Some of these hazards have persisted for generations. Erosion and unpredictable rainfall patterns have exposed communities across the state to the adverse impacts of a changing climate. It is even more disturbing to know that the frequency of hazards in these local communities is on the rise (Ekpo and Asuqwo, 2012). Early and late onset of rain which has led to irregular planting patterns and floods has been documented across the state. There is also the issue of rising temperature which has caused problems for local communities. While such hazards are a product of the natural environment and climate, there are also hazards caused by human factors

such as poor governance and weak structures, which affect local communities (Ekpo and Asuqwo, 2012). However, the focus on the research was narrowed to communities in the Nsukka local government area of the state and surrounding localities. This is because one of the methodologies used (ethnography) involves residing in a community, trying to become part of that community to be able to observe the behaviours, perceptions and approaches used by people in the community to tackle everyday issues. Focusing on the Nsukka community and its environs proved fruitful as members of the community could give in-depth interviews that were relevant to this research. Some of the local communities in Nsukka include Opi, Alauno, Ede-Oballa, Obukpa and Edem. A handful of interviews were also conducted in other nearby towns like Nike in Enugu North LGA, Obollo-Afor and Obollo in Udenu LGA and within the capital city of Enugu.

4.2: Reasons for selection of study area:

The impacts of natural hazards are felt across all the regions of Nigeria. Soil erosion is the most common type of natural hazard in Nigeria. This type of erosion is very common in communities in Enugu, Anambra, Imo, Abia states and Ebonyi states. The impacts of erosion have led to loss of lives and livelihoods, destruction of roads, farmlands and homes in these states. There are fears that the impacts will continue to grow as annual rainfalls which contribute to erosion have exceeded 2000mm (Igwe and Fukuoka, 2010). The intensity of erosions has led to some communities being cut-off from cities for decades (Vanguard News, 2015). The rainfall intensity is very high and the rainy season lasts for shorter periods. The rainfall also leads to devastating floods. In 2012, flood disasters caused a scale of damage in Nigeria that had never been witnessed before. The floods led to the displacement of over 2 million people across the country and claimed hundreds of lives. In communities in Enugu state, poor drainage systems and overflowing rivers have led to flood disasters that have displaced families and led to livelihood losses (Iyi and Ugwuanyi, 2014). However, it is not just natural hazards that are causing problems in Enugu state. There is growing conflict between Fulani herdsmen and farmers in the state that has led to loss of lives. This conflict has affected communities in Nsukka as well (Vanguard News, 2016). A mixture of these several types of hazards led to the interest in researching the perceptions of local people in the presence of such mix of hazards in Nsukka and other communities around.

The communities that were selected for the study were chosen because of several factors. Some of these communities were strategic points during the Nigerian-Biafra war and are home to communities that border the Middle Belt region of Nigeria. There was a lot of information to be gathered on people's perceptions on the issues of governance in disaster and hazards management, the importance of community and some ethnical underpinnings as well. Some areas within these communities have not fully recovered from the impact of the civil war. There is also the issue about the location and how environmental factors are some of the core determinants of the outcome of hazards. Households have been affected by the impacts of continuous hazards and livelihoods are poor in some of these communities. The Nsukka community experiences constant flooding, which washes away portions of the road, leading to poor access to the town from inner communities. Landslides and erosions also affect families. Another serious threat is communal conflicts which are on the rise, due to the interaction between nomadic herdsmen and the local people. Limited resources and poor development inhibits growth and although the town is home to one of the most recognisable university in Nigeria (University of Nigeria, Nsukka), most members of the community struggle to make ends meet. A considerable number of households in the communities grow their own crops as farming is one of the major sources of sustenance and income. However, the growing impact of floods and the difficulty in predicting the changing seasons has led to loss of livelihoods in these communities. The impact of natural hazards, community and governance factors all come together to determine how members of the communities perceive hazards and disasters. Perceptions of the individuals in the communities influence the disaster risks outcomes. Despite various challenges, households in Nsukka and environs still find ways to survive and try to develop.

There is a consensus that the best ways of managing disasters are by planning for hazards which can lead to disasters, before the disaster incidence. This involves the use of mitigative strategies such as insurance for disaster management (Surminski, 2013). However, in situations where such strategies cannot be achieved, there is a need for government to invest in social capacity initiatives for communities, to help them build resilience (Aldrich and Meyer, 2015). Unfortunately, such strategies are rarely seen in most developing countries. In the case of Nigeria insurance for households in communities is practically non-existent. The households and businesses in Nsukka community do not receive any forms of insurance from the government; hence there is heavy dependence on communal relationships and local strategies for hazards and disasters management.

4.3: Brief Introduction to Nsukka, Enugu State:

Nsukka is a town and Local Government Area in South-East Nigeria in Enugu State. It is home to communities such as Edem, Ibagwa, Opi, Orba and Ede-Oballa. Neighboring towns to Nsukka include Enugu Ezike, Obollo-Afor, Mkpologwu, Nimbo, Adani and Uzo Uwani. Some local communities within these towns claim to be part of Nsukka and like to be addressed as communities of Nsukka town because they belong to the same as senatorial zone of Enugu state. The communities that fall under Nsukka local government area cover an area equivalent to 1,810 km². At the 2006 census, the population of Nsukka was placed at over 309,000 residents. However, the senatorial zone is estimated to be home to over 1.3 million people. Nsukka Town is home to one of the most prestigious universities in Nigeria (University of Nigeria, Nsukka) which is recognised as the first indigenous university in Nigeria. It was founded by the late Dr. Nnamdi Azikiwe who was the first civilian president of Nigeria. The town lies in the Udi Hills area and is a town known for communities that cultivate yams, palm oil, cassava, and corn. In the past, coal deposits have been found in the town and neighbouring towns like Obollo (Britannica, 2009; Naijasky, 2014). The origins of the Nsukka people are not extensively documented in the literature; however, the earliest people who became known as Nsukka people had early associations with the Kingdom of Nri and were influenced by the Igala and Idoma people in the Middle-Belt region. The Igala impact on the Nsukka people has been traced back to colonial times. Between 1908 and 1919, the community was attached to the administrative division of Okpoga (Okwoga in colonial times) in Idoma Land, from where they were attached to Obollo before becoming an independent division. They continue to identify themselves as people of common interest and cultural independence (Afigbo, 1981: pg. 69-70). Nsukka communities are known for their rich culture, such as the Omabe Festival (the most celebrated culture in Nsukka communities), which involves the display of masquerades believed to come from the underworld in traditional circles, the Onwa Ito (the third moon or month) Festival, which in the past is characterised by the slaughtering of chicken in dedication to the children in every household and to the memory of loved ones who have passed away in the extended family. Other traditions of the Nsukka people include the New Yam Festival, which introduces the harvest of yams in communities and the Onwa Asaa (the seventh moon or month) festival which introduces the eating of dried cocoyams (Naijasky,2014).

4.4: Hazards in Nsukka communities:

Nsukka communities have been affected by several hazards and disasters in the past. Due to lack of a dedicated database that documents hazards, information on hazards impacts on Nsukka communities have been gathered by searching the literature for studies which had been carried out by researchers in the past as well as from media sources. Going through online sources and literature, it is discovered that hazards such as wind storms, floods, water shortages affect various communities in Nsukka (Mobosi and Madueme, 2016). These hazards have had serious impacts local people, their livelihoods and environment in Nsukka communities from the past. Apart from these hazards which may be attributed to climate change, there is also the impact of civil unrest and conflicts. Such conflicts like the Nigerian Civil War led to the development of other hazards, such as mass hunger and disease epidemics. The precursor to the civil war was a coup d'état carried out by some members of the Nigerian Army in 1966 that led to the death of the Prime Minister, Alhaji Abubakar Tafawa Belewa (a northerner). Agitations by the Northerners led to months of ethnic killings and displacement of the Ibo people living in the Northern part of the country. In a bid to protect the Ibo people, the Eastern Region government declared the Republic of Biafra in 1967. However, this led to the declaration of war on the Biafrans by the Nigerian government (Nwokocha, 1977). The Nigerian Civil War which lasted from 1967 to 1970 severely affected all regions of Southeast Nigeria. The war led to disruption in food production processes in the region and this led to widespread hunger and starvation. The disruption was because of people abandoning farming due to unsafe conditions and the able-bodied being enlisted in the Army (Iwuagwu, 2012). The food shortages led to reports of kwashiorkor disease caused by protein deficiency in children and adults in rural communities of the Southeast. Malnutrition and infant mortality spread across the region. The inability of the Biafran government to obtain food and drug supplies from the International Red Cross intensified the hunger and malnutrition across all communities in Biafra, including Nsukka (Nwokocha, 1977; Oha-na-Eze Ndi Igbo, 1999).

Even earlier than starvation and diseases during the Civil War in Nsukka is the menace of erosion and floods. Going back to the 1930s, the concern over expanding erosion problems in the Southeast of Nigeria led the colonial government to plant trees along steep slopes of upland landscapes in the region. Although the earliest gully sites in the Southeast of Nigeria were in Agulu, Nanka, Oko in Anambra state and Isikwuato and Orlu in Imo states, the erosion menace has extended to all states of the Southeast region of Nigeria. This has led to loss of agricultural lands and livelihoods of families in local communities. Factors that have contributed to the expanding erosion problems include the topology and geomorphology of Southeast states, deforestation, poor land use practices and increased rainfall (Igwe, 2012). Communities in Enugu state (including Nsukka communities) have not been spared by the erosion menace. In Eha Ndiagu community in Nsukka, severe gully erosion has led to an isolation of the community from other communities in Nsukka. The erosion, which has contributed to loss of livelihoods and income losses for residents for over 40 years, has also led to a low level of education within the community. Due to the difficulty in gaining access to the community, most government teachers posted to the community are unwilling to go there as they do not want to experience the hardship faced by the members of the community (Vanguard, 2015). Gully erosion gives rise to landslides that wreak havoc on local communities. In late 2015, landslides affected Onuiyi community in Nsukka leading to loss of local routes, created cracks in houses and displaced a lot of families. The massive landslide occurred due to the favourable condition created by an erosion site on Onuiyi-Obollo Afor road in Nsukka. This erosion site had before then, claimed lots of arable farmlands and led to loss of livelihoods for local people. Heavy rainfall was the trigger that led to the landslide. It was found that increase in annual rainfall in Nsukka communities have contributed to expanding erosion problems for a long time (Obi and Ngwu, 1988). The greatest threat to the environment in Southeast Nigeria is the continuous destruction of the landscape by soil and gully erosions over the years. Current annual rainfall in the south of Nigeria can reach up to 2500mm. This has contributed to increased cases of landslides, erosions and flooding in various parts of Southeast Nigeria (Igwe, 2012).

Slow onset and new hazards that are resulting from climate change are impacting negatively on the lives and livelihoods of people living in Southeast Nigeria. Increased rainfall, floods and erosion are causing long-term environmental damage to agricultural productivity in the Southeast (NEST, 2012 – Nigerian Environmental Study/Action Team). Studies have also projected an increase in annual temperature in the Southeast region, including Nsukka, by 0.04 degrees Celsius on a yearly basis until 2065. There are also projections of increased rainfall by 15mm annually. These will lead to increase in extreme weather events like heat waves and rainstorms in communities like Nsukka (NEST, 2012). These projections will lead to more hazards in the future as it is estimated that about 70% of people in Nsukka communities rely on subsistence farming and agriculture, with 65% of these people being women. With a steady rise in population and poverty levels, there will be more pressure on local families to obtain sufficient resources essential for survival in Nsukka communities. There is evidence that climate change has led to reduced crop yields in Nsukka communities over the years (Mobosi and Madueme, 2016).

4.5: Conclusion:

This chapter introduced the research location and a brief introduction of the communities was presented. A brief origin of the local people was presented, as well as some of their culture and local traditions. The chapter went on to highlight the hazards which affect the communities. Some are these hazards have anthropological origins and new hazards which are influenced by climate change are also causing vulnerability in the local communities. The hazards and disasters were then traced down to Nsukka communities to present available literature on hazards and disasters in Nsukka communities. A brief history on the origin and location of Nsukka was also presented in this chapter. The next chapter presents the findings from the research. It starts with an introduction to the respondents then progresses to the actual findings. The perceptions of the local people to the hazards in their communities and the impacts in their lives and livelihoods are captured in the next chapter.

FINDINGS

5.0: HAZARDS PERCEPTIONS AT COMMUNITY LEVEL

5.1: Introduction:

The previous chapter looked at the hazards and disasters profile of Nigeria, with focus on South East Nigeria. It highlighted various major hazards and disasters, which the people of this region have faced for decades. The chapter also demonstrated that because the focus on hazards and disasters in the context of the country in general, is on the insecurities in the North and the oil spillage issues in the South-South. This has led to a sort of isolation for the people of the South-East, who experience major hazards daily. The next part of the thesis presents the findings from the respondents in the various local communities that took part in the research. Different people have different perceptions of what risk is; what one individual may identify as a risk, another may view as something entirely different (Boholm, 1996). People's perceptions on what constitutes a risk influence how their lives are shaped daily. Risk perception varies from individuals to communities' perceptions. Risk perceptions are 'judgements' or 'approaches' which are taken about existing or intending hazards (Slovic, 2000). While understanding people's perception to risk was initially analysed through trying to understand how people's cognitive senses work (Pidgeon and Beattie, 1998), there is growing recognition on the importance of understanding socio-cultural factors which influence risk perceptions about hazards (Bickerstaff, 2004; Horlick-Jones et al, 2003). The dominant theories in the study of risks perception had been the psychometrics approach (Slovic and Fischhoff, 1980; Slovic, 2000) and the cultural theory approach (Douglas and Wildavsky, 1982; Douglas, 1992), respectively. However, the influence of people's culture, traditions, knowledge, social structure and location in their perceptions of risk is becoming a more recognisable concept (Horlick-Jones et al, 2003). Local people's perceptions of risks could also be shaped by the level of exposure to hazards, the capacities and options available to manage hazards, and the implications for continuous stay at a location (Heijmans, 2004). The psychometrics and cultural theory approaches to perceptions of risk relies on a questionnaire-based approach in gathering data. However, it has been argued that this single-method approach fails to expose the key complexities that define people's perceptions (Krimsky and Golding, 1992; Horlick-Jones *et al.*, 2003). The 'new' approach to understanding local people's perception of risk advocates for a mixed methods approach in carrying out studies that relate to understanding local people's perceptions to risk and hazards, to capture rich details and obtain in-depth understanding of risk issues (Hilgatner, 1992; Horlick-Jones *et al.*, 2003).

To understand what people in the local communities, perceive as the risks and hazards which influence their daily lives, the researcher continues with a mixed methods approach, as advocated in the methodology chapter of the thesis. This includes findings from questionnaires, semi-structured interviews and observations in the local community. It has been argued that perception of risks varies among different individuals based on socio-economic status, impact and proximity of the hazard and demographic issues, irrespective of their location (Lindell and Perry, 2004). The researcher was interested in understanding what different people who make up the communities in Nsukka perceive risks and hazards. Primary data sources obtained from interviews with heads of households, market women, young people, religious and community leaders are presented in this part of the thesis. It also draws on details from the observation of the researcher when carrying out ethnography in the Nsukka community. A review on a bit of literature available on the perceptions of hazards is presented, then the chapter moves on to the findings on what the local people perceive to be hazards to them and how these affect their daily lives. The researcher will then attempt to link how personal beliefs, local culture and traditions influence how people understand hazards. This will broaden the concept of hazards perception into a framework that puts the influence of personal beliefs and communal beliefs as determinants in what could be classified as hazards in local communities. The chapter will aim to answer the following questions:

- What are the hazards and disasters that affect the local people?
- What factors influence people's perception of the hazards?
- How do these hazards affect local people's livelihoods?
- How do families manage these hazards?

5.2: Characteristics of Respondents for Research Work:

The researcher returned to the field to commence six months of fieldwork. For the main data to be gathered throughout a chosen period from the community, the researcher had to reside within the community for a while. On arrival and securing accommodation, the researcher made an acquaintance (gatekeeper) who helped him find respondents at the very early stage of the fieldwork, before the researcher settled well in the community and became a regular face to the community members. After the first couple of months, the researcher could find his way around villages and request for interviews about the community. The researcher went out every other day, asking to interview members of the community and observing how things are done in relation to hazards in the community. For the main study, 80 semi-structured interviews were conducted, 5 interviews were conducted with key stakeholders and 6 focus group discussions took place throughout the research. The rest were with the general members of the community, made up of heads of families, market women, youths, business owners and community civil servants.

The researcher also went into the field with closed-ended questionnaires which he gave out to be distributed to 81 National Youth Service Corps (NYSC[1]) EMVs[2] (Emergency Management Vanguards). The researcher got 72 of the questionnaires back and they are used in the third findings chapter of this research. The observations made in the field throughout the ethnographic process will also be presented within the results. Different communities and villages make up Nsukka. To be able to cover these towns, the researcher used a random sampling approach to obtaining interviews. There were situations where respondents referred the researcher to other members in the community, who had more in-depth knowledge about the situations in the communities. This is a form of research known as snowball sampling and it is argued that it generates current data, provides update on the political landscape and is interactional (Noy, 2008). Table 5.1 presents the various communities in Nsukka where the researcher could conduct semi-structured interviews and the number of respondents and Table 5.2 presents the respondents from the focus groups.

[1] The National Youth Service Corps program is a government scheme established in 1973. The program requires graduates to undertake community service in a community for one year.

[2] EMVs is a program established by National Emergency Management Agency (NEMA) which trains youth corps members on community DRR

Table 5.1: Nsukka Communities and Number of Respondents

Name of Nsukka Community	**Number of respondents from community**	**Gender of respondents from community**	
		Male	**Female**
Opi-Agu	5	3	2
Eha Ndiagu	5	3	2
Edem	4	2	2
Agu-Echara	5	3	2
Ununyi, Ovoko	4	3	1
Umunedem, Ameni	5	2	3
Onuiyi	5	3	2
Owerri-Ani	5	4	1
Edeoha	4	3	1
Ibagwa	5	3	2
Agbamere	5	3	2
Akpotoro, Obimo	5	2	3
Obukpa	5	4	1
Nru	5	3	2
Orba	5	3	2
Ede Oballa	4	2	2
Alor-Uno	4	2	2
TOTAL	**80**	**48**	**32**

Source: Author

Table 5.2: Focus Group Respondents

Focus Group	Community	Number of Participants	Characteristics of Participants
Market women	Agu Echara Eha Ndiagu	4 3	Foodstuff sellers Foodstuff sellers
Male community members at local bar	Onuiyi	5	Local government workers – 1 Teachers at community schools – 2 Farmer – 1 Unemployed – 1
Group of local farmers	Owerri-Ani Akpotoro	4 4	
Youths at a social gathering in a community	Edem	6	Graduate – 1 Undergraduate – 1 Learning trade – 2 *Okada* riders[3] – 2
Group of menial jobs' workers in a community	Nru	3	
Keke[4] drivers at local community	Ibagwa	5	

Source: Author

The respondents in the study have various occupations (Table 5.3), from teachers and farmers to business owners and unemployed people. In some cases, the respondents talked about hazards in relation to their occupations; in order cases, they talked about hazards in relation to their daily lives.

[3] *Okada* riders are people who make their living by transporting people on motorbikes.
[4] *Keke* is the popular term used to describe tricycles used for transporting people and goods.

Table 5.3: Occupations of Semi-Structured Interviews Respondents

		M	F
Government employee	11	6	5
Private business owner/employee	22	15	7
Farmer	38	27	11
Unemployed	9	3	6

Source: Author

5.3: Characteristics of Respondents:

Demographic characteristics of the respondents were taken into consideration throughout the research process. These characteristics include the age, sex, education level and occupation of the respondents. The study involved people who originate from the communities. In some cases, the respondents were not originally from the communities where they reside. In such cases, the researcher ensured that the respondents had lived in the communities for over 10 years. The reason for this is to ensure that slow onset hazards and disasters that have affected local people for generations can be part of the study. The process of involving people who have lived in the community for less than 10 years in the study might have led to loss of credible information as relates to hazards and disasters within communities. The study assumed that anyone who had lived in a community for over 10 years would have gathered significant knowledge and experiences on the various hazards and disasters that affect the community they reside in. For this study, 80 respondents took part in semi-structured interviews. Out of these, 60% were men while 40% were women. While the percentage of responses does not directly influence the outcome of the study directly, it is important to mention that some local women who were approached for interviews refused because they believed their husbands or the head of their kindred should be the one granting such interviews to the researcher. Even though they are not part of this study, it is important to mention that they argued that it is the role of the head of the house to discuss issues that concern the community with researchers. The typical Ibo family consists of the father, mother and children. The Ibos culturally consider the man (father) as the head of the family and he is the one who represents the family ideals. He is the one that speaks for the family (Ejiofor, 1981; Ikwubuzo, 2012). Therefore, the women who refused to grant interviews to the researcher were right from their cultural perception.

5.3.1: The Car and Nigerian Elections Effect:

During the initial stages of the fieldwork, the researcher found it difficult to move from one local community to another. The research pleaded with a relative and borrowed one of his vehicles to make it easier to access communities, on the conditions of fuelling the car and constant maintenance for 3 months. While it provided an immediate solution to the researcher's transportation problems, it had its disadvantages. The researcher observed that when he drove up to different people in Nsukka communities and told them he wanted to find out about hazards in their communities, they turned him away. There were looks of mistrust on faces. The researcher got responses such as:

'Why do you want to know about our community?'

'Who sent you?'

'I do not talk to strangers'

To make matters worse, the researcher was conducting his fieldwork at the time when Nigeria was preparing for its general elections. States and communities were on edge and fresh faces in local communities were looked upon as political mercenaries or spies. The researcher had a first-hand experience of this, as there were situations where the researcher was asked direct questions, such as:

'Who are you campaigning for?'

'Are you a politician?'

'What political party do you belong to?'

'Who is your sponsor?'

After almost 2 weeks without getting a single response from members of various communities, despite speaking the local language fluently and showing them documentation, the researcher had to return the car to his relative. Although it took a while to understand the different routes in the communities, it was easier for local people to open to someone who looked neutral, ate at very local restaurants, sat at very local bars and walked around the community in very casual ensemble.

5.4: Hazard Perceptions in Nsukka Communities:

One of the most crucial factors that influence people's preparedness for the impacts of hazards and disasters, and their responses and recovery from such threats, are their perceptions towards what risks are (Bradford *et al*, 2012; Xu *et al*, 2014). People's perceptions towards risks and hazards in their daily lives are shaped by previous experiences, their socio-economic conditions, the characteristics of risks in daily lives, their culture and the environment where they live (Xu *et al*, 2014). This section presents the perceptions, understanding and views of members on the hazards that affect them in their daily lives. The findings show that people in these communities perceive hazards differently. A hazard for one family may not be a cause for concern in another family. The respondents in the research come from various locations and have varying levels of socio-economic strength. The findings reveal that from the onset, the way each respondent defined what hazards are shows the relevance of hazards in their daily lives. While some defined hazards as conditions that limit their access to their income and livelihoods, other defined hazards as conditions that can cause harm within the communities. Most of the respondents interviewed in the selected communities demonstrated elevated levels of understanding, knowledge and awareness of what the hazards that affect their daily lives are. The research showed that out of 114 respondents who participated in the semi-structured interviews (80 individual interviewees and 34 individuals in focus groups), 73 respondents (which is equivalent to 63% of the total respondents) believed that weather and climatic conditions are not the only causes of hazards and disasters; they were aware that human error could lead to hazards and disasters, like in the case of fires or accidents. Interestingly, only 42 respondents (equivalent to 36.2%) out of the 116 respondents were familiar with the concept of climate change.

Most of the people who understood the concept of climate change were young teachers and some government workers, all between the ages of 35-45. The higher level in understanding the concept of climate change and its impact on changing weather patterns as shown by the younger respondents may be attributed to higher literacy levels among the younger respondents. Most of the older respondents had either attended school at very young ages and dropped out or had not attended school at all. It is important to mention however, that some other respondents who were not familiar with the concept of climate change still understood that increased rainfall intensity and expanding erosion are climate-related hazards (Table 5.4). Although many of the respondents mentioned increased rainfalls that lead to floods and higher temperatures as hazards, they did not have an idea why these conditions were occurring. On the issue of preparing for hazards, it was discovered that the older members of the communities (50 years and above) were usually able to understand weather patterns better in preparation for heavy rains that could lead to floods. However, it was also discovered that the younger

respondents in the communities (49 years and below) had faster response time to the impact of hazards and prevent disasters in most instances. Local culture, religious beliefs and faith also play major roles in the way the local people perceive disaster. The belief in the will of God, destiny and fate play major roles in how the respondents perceive hazards and disasters in their daily lives.

Table 5.4: Age, Level of Education and Awareness on Climate Hazards and Local Knowledge

AGE RANGE OF RESPONDENTS			
25 – 35 years	***35 – 45 years***	***45 – 55 years***	***55 and above***
13	**19**	**30**	**49**
LEVEL OF EDUCATION			
Non-literate	***Primary-level educated***	***Secondary-level educated***	***University Graduate***
27	**62**	**12**	**10**
AWARENESS ON CLIMATE-RELATED HAZARDS			
25 – 35 years	***35 – 45 years***	***45 – 55 years***	***55 and above***
7	**33**	**17**	**4**
AWARENESS ON LOCAL KNOWLEDGE			
25 – 35 years	***35 – 45 years***	***45 – 55 years***	***55 and above***
13	**19**	**19**	**33**

Source: Author

5.4.1: Definition of Hazards from respondents' perspectives:

As highlighted in the previous chapter, the people of South-East Nigeria experience several types of hazards. The hazards that affect households and communities in Nsukka range from floods and erosions, to communal clashes and civil unrest. While these hazards can be generalised when trying to develop a knowledge guideline for the government and other stakeholders, it was important to understand how individuals and households rate the hazards they face on daily basis. A businessperson's classification of what hazards affects his or her daily life, would be different from what a local farmer would classify as his or her own hazard. This study shows that the main hazards which affect the lives of members of the community are floods caused irregular and unpredictable rainfall patterns, and distinct types of erosions. Although these hazards have always been constant in the lives of these respondents, little has been done to help the problems posed by these hazards. Most respondents agree that it is difficult to get access to people who represent them in government, to let them know of the issues they face. The community members use various methods to adapt in the best way they can, while leaving the rest up to God. Through the responses obtained from the respondents, it is discovered that the way people encounter and deal with hazards in their daily lives go a long way towards shaping the perceptions towards such risks and hazards affecting their local communities. Another hazard which the respondents mentioned is the menace caused by Fulani herdsmen who migrate from the North down to the South. There have been conflicts between these migrating herdsmen and local communities in Nsukka that have led to destruction of properties, injuries and loss of lives. There are also political and ethical underpinnings to this issue of Fulani herdsmen migration as will be presented here. For some respondents, different hazards affect their daily lives. The respondents had different perspectives and definitions of what they think hazards and are. These definitions were based on what the respondents understood disasters to be and what hazards mean to them. The researcher found that the definitions of hazards given by the respondents fell into various categories.

The first problem associated with the definitions of hazards as given by the respondents, is related to the Ibo language itself. Over 75% of the respondents are local people who granted interviews to the researcher in the local Ibo language. In the Ibo language, the word for **risk** is '***ihe ize ndu***' and the word for **disaster** is '***odachi***'. There is no word for 'hazard' in the Ibo language. This created a situation where the researcher had to use a combination of risk and disaster to make the respondents understand what a hazard is. This is what the researcher understands led to the different perceptions of hazards given by the respondents. However, it is important that note that all definitions of hazards given by the respondents are still credible definitions highlighting what hazards mean to people. The changing climate around the world means that countries have become more at risk of hazards. Communities in underdeveloped and developing countries are most at risk from the impact of hazards. New hazards are affecting various communities across the world, even as continuous hazards plague communities with slow onset disasters. These hazards and disasters are responsible for about 35% of death on a yearly basis in sub-Saharan Africa alone. Hazards such as lack of portable drinking water, malaria, air pollution and the impact of climate change are some of the issues that lead to disasters in African communities (WHO, 2017). There is a need for members of local communities to be aware of the hazards that affect their daily lives. This goes a long way towards preventing disasters and helping local communities cope better (IFRC, 2011). It is against this backdrop that this section presents what hazards mean to the local people in the Nsukka communities. The findings reveal that most respondents from the local communities understand what hazards are. It is important to mention again that in most cases, there was a need to explain using a combination of the two Ibo phrases: ***'ihe ize ndu'*** and ***'odachi'*** (which mean risk and disaster in the Ibo language respectively. The first interview question by the researcher was: ***'What do you understand as hazards'?***

Over 75% of the semi-structured interviews were conducted in the Ibo language, so it was important that the researcher translated the interview questions correctly from English, to get the appropriate response. For this first interview question, the researcher translated it into the Ibo language thus: ***'Kedu ihe ighotara bu ihe ize ndu na ndu ubochi nile'?*** This translates directly into English as ***'What do you understand as risks in daily life'?*** While all the respondents (100%) were aware of the

various hazards that affect them in their daily lives, two different definitions of hazards from the perspective of the respondents were captured from the interviews. Some respondents defined hazards as conditions that cause difficulty in daily lives, causing hindrances to the normal flow of daily life. As one respondent puts it:

> ***Key respondent*:**
> *'Hazards are conditions within and outside the community, which makes carrying out our daily business become a struggle in the community'.*

This definition of hazard along these lines will be termed as '*Hazard Definition A'.* A second definition was given by some of the respondents. This definition captured the elements of accidents and unsafe conditions with the potential to cause harm, injury, loss of lives and livelihoods. In the words of a second key respondent:

> ***Key respondent*:**
> *'Hazards are things that make life difficult for the rural people and cause harm. Situations and things that can lead to accidents; things that have the potential to cause harm, injure people and negatively affect lives and livelihoods'*.

The researcher will term definitions along these lines as *'Hazard Definition B'*. Of the 80 respondents who granted the semi-structured interviews, 38 of them defined hazards along the lines of Hazard Definition A; the remaining 42 defined hazards to capture the key aspects of Hazard Definition B. A hazard, as defined by the UNISDR, is *'a dangerous phenomenon, substance, human activity or condition that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage'* (UNISDR, 2009). This definition captures the key ideas presented in both definitions of hazards by the local people. Situations and conditions that make life difficult for the local people could lead to loss of livelihoods, which could make people more vulnerable to the impacts of disasters. These conditions could be natural or man-made. In either case, they both lead to adverse effect in the lives and livelihoods of members of the community.

5.4.2: Classification of Hazards in Nsukka communities:

Data obtained from the respondents show that all respondents are affected by different hazards and these hazards influence their daily lives in the community. Some respondents are affected by the impact of natural hazards, some are affected by the impact of man-made hazards and some others are affected by the impact of a combination of natural and man-made hazards. Hazards which affect the respondents include floods, erosion (soil and gully), elevated temperatures, lack of basic amenities, bad and dangerous roads, insecurity and others. There was a tendency for some of the respondents to highlight lack of resources as hazards. In some scenarios, a lack of resources could become a hazard, especially in a situation where the resources are needed to mitigate the impacts of other hazards. The researcher made sure that the respondents understood the need to mention the hazards that affect them and their families directly and not generalise hazards. Qualitative research seeks to provide rich understanding of issues that affect people through in-depth study; generalisation does not provide such understanding (Polit and Beck, 2010). Data obtained through the interviews with respondents showed that various hazards affect communities in Nsukka. However, due to a lack of an official statistics, the hazards and impacts in terms of number of deaths, numbers affected and the economic and livelihood impacts are conflicting. There are also variations in how the respondents cost the impacts of hazards. The data presented shows the hazards and disasters recollected by the respondents and focus group participants, their estimates on the year of occurrence and the impacts to their livelihoods. The frequencies of the hazards as mentioned by the different respondents in each of the communities where semi-structured interviews were carried out are presented (Table 5.5).

Table 5.5: Different Hazards and Frequencies in Nsukka Communities

Hazards	OpiAgu	Eha Ndiagu	Edem	Agu Echara	Unuiyi Ovoko	Umu-nedem Ameni	Onuiyi	Owerri-Ani	Edeoha	Ibagwa	Agbamere	Akpotoro Obimo	Obukpa	Nru	Orba	Ede Oballa	Alor Uno	Total
	Number of times specific hazards are mentioned by respondents in different communities																	
Floods	5	5	4	4	3	4	4	5	4	4	5	3	4	4	5	4	3	**70**
Erosion	2	3	1	4	1	2	2	2	2	2	3	2	1	2	2	2	1	**34**
Conflicts	2	1	1	1	2	2	1	2	1	2	3	3	2	2	3	2	1	**31**
Lack of Amenities/ Resources	3	3	4	3	2	2	3	1	3	2	3	4	4	2	3	2	4	**48**
Hazards on community roads	3	3	2	4	5	2	3	4	2	4	3	4	3	3	3	4	2	**54**
Heatwave	3	2	2	1	3	3	2	1	1	3	2	2	2	1	3	3	1	**35**

This data was obtained from the responses in the participants in the semi-structured interviews. Some of the respondents gave instances on when the hazards occurred and the how the hazards affected them. It is important to highlight how the different hazards have affected members of the various communities.

5.5: Conclusion:

This chapter has outlined the characteristics of the respondents in the Nsukka communities that participated in this research. The local people's perceptions on what hazards mean to them are presented and their scepticism and concerns about this research. The next chapter presents the hazards which affect Nsukka communities, the perceptions of the local people and factors which influence households and livelihoods in the face of hazards in Nsukka communities. The chapter will also show how mitigation and adaptation strategies of members of local community influence vulnerability to natural hazards in the different communities. The hazards are divided into natural hazards and man-induced hazards. This makes the analysis clearer for the research findings.

6.0: NATURAL HAZARDS IN NSUKKA COMMUNITIES

6.1: Introduction:

Natural hazards are hazards created by the forces of nature and they threaten lives, properties, livelihoods and the environment in general. These types are hazards originate from natural processes and the environment (UNISDR, 2009; IFRC, 2017). Natural hazards can be categorised into climatic or climatological hazards (such as droughts and extreme temperatures), hydrological hazards (such as floods), meteorological hazards (such as storms), geological and geophysical hazards (such as landslides and erosions) and biological hazards (such as disease epidemics) (Bryant, 2005; IFRC, 2017). From data gathered in this research, Nsukka communities are affected by hydrological, geophysical and climatic natural hazards. The perceptions of the local people to these natural hazards and the impacts on their lives and livelihoods are presented in the following section. The chapter will also show how beliefs, traditions and local customs influence hazards and disasters perception and management in Nsukka communities.

6.2: Floods:

The most frequent hazards reported by the respondents were floods. Floods affect all the local communities throughout Nsukka. These floods range from minor floods which can cause minor hindrances to daily commute to floods that have led to loss of lives and livelihoods over a prolonged period. Although the respondents remember various floods which have caused difficulties for them, the memory of the floods of 2012 seemed to be fresh on the minds of the respondents, due to the impacts on lives and livelihoods. The floods submerged house, markets and schools, and led to loss of arable farmlands and livestock. As was reported by the BBC at that time, the 2012 flooding in Nigeria was the worst in 50 years. It led to the loss of over 350 lives (BBC, 2012). In the official report presented by the Federal Government of Nigeria to the United Nations, the floods affected over three million people and over five thousand were injured. The assets destroyed by the 2012 floods in Nigeria were estimated to be over 1 trillion naira. This was an equivalent of 9 billion US dollars at that time. The negative impact of the flood represented 35 percent% losses in the Nigerian GDP for 2011 (GFDRR, 2013). Respondents in the study revealed that the issue of floods have affected them for decades. However, there were specific references to the floods of 2012. The floods affected states in all geopolitical regions of Nigeria, affecting local communities and urban areas as well. As shown by the response of this man from Edem community in Nsukka, the floods affected properties and sources of livelihoods:

> **Male labourer at Edem community (primary school educated, aged 43):**
> *'I will never forget the 12th of July 2012, in my life. That day, the rain was so heavy that it flooded our communal compound and entered the houses of my brothers and me. I had just furnished my own apartment in January that year, as I got married in December 2011 [...] I lost almost all my furnishing as they did not dry early enough after the rains and developed moulds. The communal land my father left for me and my brothers at the back of our house, where we planted crops we harvested and ate was totally washed away [...] Till today, the land has not recovered as it is now continuously affected by soil erosion'.*

As seen from the respondent's statement, floods in Nsukka communities could lead to loss of properties and sources of livelihood. Before the 2012 floods, local people in communities in Nsukka have always been affected by floods. Local communities find ways of managing these floods and are beginning to accept them as norm. Attempts to manage the impacts of these floods have been mostly unsuccessful in most cases in these local communities. The floods have affected Nsukka communities for decades as this farmer from Ovoko told the researcher:

> **Male farmer from Unuiyi, Ovoko community (non-literate, aged 71):**
> *'We have always suffered from floods, it is normal [...] If I remember clearly, the rains started getting heavier in the early 1990s and this has led to floods every few years since then. Every year, after the first rains come, one must plan for the impacts because you do not know if there would be severe floods that year'.*

This response shows that floods have affected Nsukka for decades and there is a need to prepare for the rainy season in the communities, even before the rains come. However, some respondents said that being unsure of rain pattern made planning ahead difficult.

6.2.1: Impact of Floods on Income and Livelihoods:

The participants ranked floods as the hazards that affected them most in recent years. Some of them have come to associate floods with every rainy season. For them, the rainy season will always bring floods and the only option is to look for ways to mitigate the impacts of the floods and adapt so that such impacts do not lead to severe damages and loss of livelihoods. The floods also cause problems of access to businesses and places of work, and hinder daily activities aimed at sustaining livelihoods. The floods have led to loss of arable land for farming and have led to loss of livelihoods, especially for members of the community who rely on farm produce as a source of income. These are the local farmers whose only income comes from farming. In most of the communities in Nsukka, the researcher observed that there were a lot of local farmers. These farmers grow produce such as cassava, maize, yams and vegetables. They grow these crops on large plots of inherited lands (in the case of male farmers), lands which belong to their husbands (in the case of female farmers) or kindred lands (in the case of some male and female farmers). Some people also buy large portions of lands with their own money and decide to grow crops for commercial purposes. Constant floods have made commercial agriculture challenging in Nsukka communities. The threat of floods has led to a decrease in investment in agriculture in some communities which in the past had been hubs for agriculture in Nsukka. This farmer from Eha Ndiagu community puts this in perspective:

> **Male store owner at Eha Ndiagu community (primary school educated, aged 54):**
> *'I took up farming naturally and made it my primary source of income, as my father was a big scale farmer. I built this personal house through income from farming […] I also own a building with tenants. I used to grow cassava and maize in large quantities. I used to take my produce all the way to Ogbete market in Enugu, but in 2012, floods destroyed my maize plantations. It was so bad that I was never able to recover to become the great successful farmer I once was. It almost destroyed my life. I suffered high blood pressure problems because I lost a major source of income […] My wife and children still farm on one of the parcels of land for food we eat in the house. This provision store is what I am managing now; I started it up with my savings and part of rents paid by my tenants. I do not generate as much money as I was generating from my commercial farming, but I have to manage it'.*

The same applies to this teacher from Edem community, whose father had to give up agriculture due to erosion and flood hazards to become a teacher:

> **Female teacher at Edem community (college educated, aged 39):**
> *'I come from a family of farmers. My great-grandfather was a wealthy farmer and community chief. My grandfather was a farmer also. My father started out as a farmer but erosion and floods made him lose large portions of lands he inherited and he became unsuccessful as a farmer. He sold some of the remaining lands and put himself through training school and became a teacher'.*

As seen from these two respondents, lost income due to the flood hazard led them towards seeking alternative sources of income. For some respondents, losing their only source of income to the impact of floods has left them in poverty and this makes them more vulnerable to the impacts of various hazards and disasters, as was the case of this respondent from Obukpa community:

> **Unemployed female at Obukpa Community (non-literate, aged 41):**
> *'My husband died in 2005. Before he died, he left me a portion of land not too far from this our house. Because I did not go to school, I have always been a housewife and helped with the children in the house. After my husband died, I had to start farming on the small portion of land he left for me […] I grew maize and vegetables that provided food for me and my young son. During the heavy rains of 2012, floods washed away maize seedlings I had just planted. It was a very difficult year for me and my son. We suffered a lot and had to beg from help from my late husband's kinsmen. Till today, we are surviving on what is given to us by my husband's kinsmen from their own farms…we barely have enough to eat […] I hate that my son and I have to be nuisance to other people […] I wish my husband was alive'.*

In this woman's case, the impact of floods and the absence of an alternate source of income made her household more vulnerable to poverty. Unfortunately, this is not an isolated situation, as this response from a man at Obimo community highlights:

> **Unemployed male at Akpotoro, Obimo community (non-literate, aged 35):**
> *'Erosion and floods destroyed the farmland I inherited from my kindred through my late father. I used the farm to grow cassavas I sold at the market [...] Now I cannot plant on the land anymore because with this dry season, the soil is too sandy now and easily washes away. I cannot recover anymore. I have been feeding from hand to mouth, asking for help from my pastor. I do not even know when my next meal will come from tomorrow'.*

The local farmers in Nsukka communities told the researcher that the impacts of floods on livelihoods would not be so bad if the government gave loans to people in the communities to help in recovery. However, none of the respondents have received any loans or help from the government at any level to help mitigate the impact of floods. While some were aware of the existence of microfinancing institutions, loans were almost impossible to obtain from these institutions, as expressed by this respondent from Ede Oballa community:

> **Male farmer at Ede Oballa community (primary school educated, aged 51):**
> *'They are supposed to help people who are facing difficulties in local communities. However, if you go to take a loan, you must provide collateral. For people like us in the small community, we have no collateral. We are local farmers. All we have are our children, families and communal houses. Do they expect us to deposit our children to get loans or give up our communal houses?*'

There are other people in the local communities for whom floods create inconveniences for by disrupting their daily schedules or making them lose money. This business owner from Owerri-Ani community puts into context how the floods could cause such problems:

> **Male business owner at Owerri-Ani community (university educated, aged 44):**
> '*Floods do not affect me directly. I know people who have been affected by it, but not me. In this compound, as you can see, I have interlocking tiles. These tiles and the gutters that lead outside ensure that my house cannot be flooded [...] The problem I have with heavy rainfall that lead to floods is that it makes traffic terrible. Everybody must drive slowly or take different routes [...] For instance, after very heavy rains, if you are going to Nsukka main market through the main Enugu road, you will be stuck there for almost an hour [...] I have had situations where important customers call me early in the morning, saying they want to make large purchases, but because I am stuck in traffic, I lose money [...] A customer would not waste time waiting for you because you are stuck in traffic*'.

The respondent highlighted the impact of floods on transportation around the community. The impact could range from minor inconveniences (Plate 6.1) to a total shutdown of transportation routes (Plate 6.2).

Plate 6.1: Impacts of rainfall, flooding and poor drainage on Nsukka-Enugu road

Source: Author

Plate 6.2: Flood completely covers main road at Echara community, 30th July 2015

Source: Author

The reason why floods affect communities in Nsukka is due to lack of adequate drainage systems within communities. Even in communities where such drainage systems exist, there is a tendency for the local people to block the drainage systems with garbage. The government and concerned agencies always warn local communities throughout Enugu state about the dangers of throwing trash in gutters and drainage systems, as it contributes to floods. One of the key respondents in this research had this to say about the issue of drainage in the state:

> **Key respondent (Zonal Planning Officer, NEMA, Enugu state):**
> *'Every time we go to local communities where flooding has caused damage, we always find out that drainage systems, especially gutters, had been fully packed with household waste. We have had this experience in Udi, Nike, Nsukka, Ezeagu and other towns in Enugu state. We keep telling people to dispose of their refuse properly, but it seems people do not care. They do what is convenient for them without knowing the impact it would have in few months' time […] It is just a case of ignorance […] It has really contributed to floods in a lot of local communities across the state'*.

While it is easy to blame the ignorance of the local people who contribute to the risk of floods by blocking drainage systems and gutters, there are situations where government installations have contributed to the risk of flooding in some local communities. One of such situations in Nsukka is the drainage system from UNN (University of Nigeria, Nsukka) to rural Alor Uno community. After rainfalls, the drainage system from the university carries water to a catchment area in Alor Uno community. This catchment area is covered by small hills and vegetation. Local community houses and local roads are located on the lower parts of the catchment area (Adaba and Aguwamba, 2014). However, with the increased intensity of rainfalls, the drainage tends to overflow and flood water enters some houses in the local community. A respondent in the community had this to say about it:

> **Male civil servant at Alor Uno community (university-educated, aged 51):**
> '*You should have seen this compound yesterday. After the rain two days ago, the whole compound was flooded. Not just our compound, but those of other people around here. The problem we have is that the drainage system from UNN overflows, floods our farmlands, wash away our soil and enter our houses […] It did not use to be so in the past. We had*

always known that water that comes through the university after rain flows through this community […] The drainage had not given us any problems before until maybe three to four years ago, when the drainage was not enough to contain the volume of rain water'.

As shown by the responses of this respondent, government installations which were initially built to control rain water have failed and led to new hazards in this local community.

6.2.2: Mitigation and Adaptation to Floods:

Most of the respondents agreed that the floods are causing more hazards for communities because rains are becoming more intense and unpredictable. There are various kinds of floods that affect communities. However, the floods that affect Nsukka communities are flash floods. Flash floods occur when continuous impacts of high intensity rainfall lead to short-duration floods of high discharge and velocity (WMO-UNESCO, 2012). This creates a destructive current that can lead to loss of lives, damage to properties and the washing away of hectares of farmlands (Etuonovbe, 2011). Nsukka communities are not the only communities affected by floods in Enugu state. Analysing the results obtained from a study of Enugu metropolitan city, Iloeje *et al* (2015) concluded that floods in Enugu metropolitan city can disrupt socio-economic processes through the destruction of infrastructure and loss of livelihoods, which creates an unsustainable city. At Enugu East local government area, the presence of various rivers and rivulets lead to floods in different communities every rainy season (Iyi and Ugwuanyi, 2014). Although floods have led to loss of livelihoods and created hardship for local people in the various communities, the researcher observed that local people did not plan enough for the rainy season. There is a low level of learning from the past impacts of floods amongst the local people. Most respondents do not perceive the onset of the rainy season as hazards, despite the knowledge that rains are becoming more intensive in recent years and leading to constant floods. Respondents who do not make plans for the hazard of increased rainfall blame it on their economic circumstances. The need to manage meagre resources means that planning for the rainy season not a priority for low income earners. During a focus group discussion at a local bar at Ameni community, a respondent told the researcher what he thought about planning for the rainy season:

Unemployed male at a bar in Umunedem, Ameni community (non-literate, age 38):
'The truth is that during the rainy season, water comes into my house from under the door in the kitchen. After the rains, my children usually just sweep the water out and use mop to dry the floor [...] It can be a problem when my wife or my daughter wants to cook while it rains [...] If I have extra money, the solution is simple. If I build a small pavement with blocks before the entrance to the kitchen, the water will not enter the house anymore'.

The response from this man at Ameni community shows that people in the community know what to do to mitigate flood hazards, but lack of financial resources hinder carrying out such mitigating strategies. Throughout the study, only 26 semi-structured interviews' respondents said they plan for heavy rains and floods on an annual basis, in response to the devastating impact floods from previous years had on their homes and livelihoods. The researcher observed that these respondents who had invested in mitigation strategies for floods had good sources of income. It was also observed that the main reason for investing in flood mitigation was mostly to protect their sources of income. Two female respondents from a focus group interview of local market women had this to say about planning for future floods:

Female market woman at Nru community (non-literate, aged 30):
'My husband and I had to save money to build a barrier in front of my shop after flood water entered my shop one night in April, 2013. I came in the morning and most of my goods had been damaged in the cartons where I put them at night. I spent over 100,000 naira to restock my spoilt goods. To build this barrier did not cost me more than 5,000 naira and flood water has never entered my shop again since then. It was a good decision to do it then. Now, I have more confidence in putting more provisions in my shop'.

Female market woman from the same market as above (non-literate, aged 57):
'In the past, the roof of this stall of mine was made with thatch and wood. But after serious rains almost two years ago, parts of the roof were blown away and rain water was falling directly on me. I had to save up some money from my fish business, hired a carpenter and bought materials that were used to build this zinc roof. No more threat of rain coming in, unless it is very windy then it blows in from the sides'.

These two market women understood the need to invest in flood mitigation strategies to protect their sources of livelihood. As shown by their responses, small investment in hazards mitigation could lead to sustainability of livelihood sources. Another finding is that lack of information on rain patterns for coming seasons create more vulnerability to floods. In this research, the respondents attested to the fact that failure to obtain information about the coming seasons made it difficult to prepare for disasters. There is no dedicated avenue for sharing information on rain patterns from the Federal government through the National Meteorological Agency down to the local people in rural communities. While households in the communities have access to multimedia channels like radios or televisions, specific weather information for specific communities are not broadcast through these. A respondent from Eha Ndiagu mentioned this to the researcher during a discussion:

Male school teacher at Eha Ndiagu community (university-educated, aged 56):
'What we hear on the news is usually generalised concerning the federal or state government [...] You cannot listen to the news and hear things like 'Eha, prepare for heavy rainfall'. The news is usually generalised, maybe concerning Enugu state […] There is no way to get specific information for our community'.

According to the perception of this respondent, the information on rainfall patterns is not available hence leaving communities more vulnerable to the possibility of floods. Another respondent seemed to blame the government for not providing enough information for the local people. The respondent seemed to link lack of rainfall information to government absence. This is what she said:

Retired female civil servant at Opi-Agu community (secondary level educated, aged 74):
'Who will give us information about the rainfall or the risk of floods? The local government chairman or the councillors we never see again immediately after they are voted in?'

This perception of this respondent is that government officials who should represent the local people are not there to provide information the local people require. However, the researcher found that while information on rainfall patterns from the government is not available, the local government carries out mitigation strategies in communities. Mitigation strategies against floods at the local communities are carried out by the local council with support from concerned parties in the communities, such as the youths and prominent community members. Ede Oballa, Nru and Opi-Agu communities had received help from the local government for the construction of gutters on the sides of some local roads. At Eha Ndiagu community, the researcher discovered that some influential members of the communities

had been able to get some small funding from the local government to construct a gutter on a major community road. One local chief at Eha Ndiagu community told the researcher how government is trying to mitigate floods by building a gutter on a major community road (Plate 6.3):

> **Local male chief at Eha Ndiagu (secondary level educated, aged 66):**
> '*Increased rainfall has always led to floods in the community […] Ever since I was a young man, I have witnessed minor and major flooding and erosion in this community […] Local chiefs like myself and some prominent sons of the community had a meeting with the Nsukka caretaker committee early last year at the secretariat. They promised to pour stones and coal tar on the road, provide a water source for the people of the community and build a gutter on our main community road to help with drainage. They just sent some people some weeks ago, to start digging the gutters*'.

This respondent is hopeful that the government initiative of building a gutter on the major community road would reduce the risk of floods.

Plate 6.3: Initial stages in the construction of a gutter at Eha Ndiagu community

Source: Author

6.2.3: Local Knowledge for Flood Management:

Without the help of government, local people use different methods to adapt to the flood. The use of local knowledge and 'common sense' help members of the communities develop strategies which have helped in flood management. Local knowledge has helped people survive and adapt to their environment for generations. It involves the use of local ideas and methods for managing problems in local communities (Jabulani, 2007; Iloka, 2016). For people in Nsukka communities, the use of local knowledge in flood management is a vital requirement for adaptation. Respondents in rural communities usually lack direct access to the government and so are mostly left to take care of themselves. Respondents in Nru and Alor-Uno communities attest to this:

> **Respondent at Nru community**:
> *'We manage floods ourselves. Government does not help us'***.**
>
> **Respondent at Alor-Uno community***:*
> *'If you wait for government to help you, you will wait forever. We use our own knowledge to manage the impacts of floods'.*

The researcher observed that members of all communities in Nsukka sourced local materials which they used in managing the impacts of floods. These materials include wood, stones and old roofing sheets. At slopping farmland areas at Agbamere community, the researcher observed that large tree trunks used to hold soil together. The use of large tree trunks holds soil in place is a typical measure used to ensure that flood water does not wash away farmlands down the slopes (Plate 6.4). A local farmer had this to say about this method:

> **Male farmer at Agbamere community (non-literate, 38 years old):**
> *'Large tree trunks and stones help to hold soil together. These trunks and stones are placed around strategies areas on the farmland and are packed close together, leaving very small spaces to allow water pass through […] The trunks not only help in keeping farmland from washing away, it also helps to prevent landslide […] This method has been used by my extended family before I was even born and as you can see, we still use it today'*.

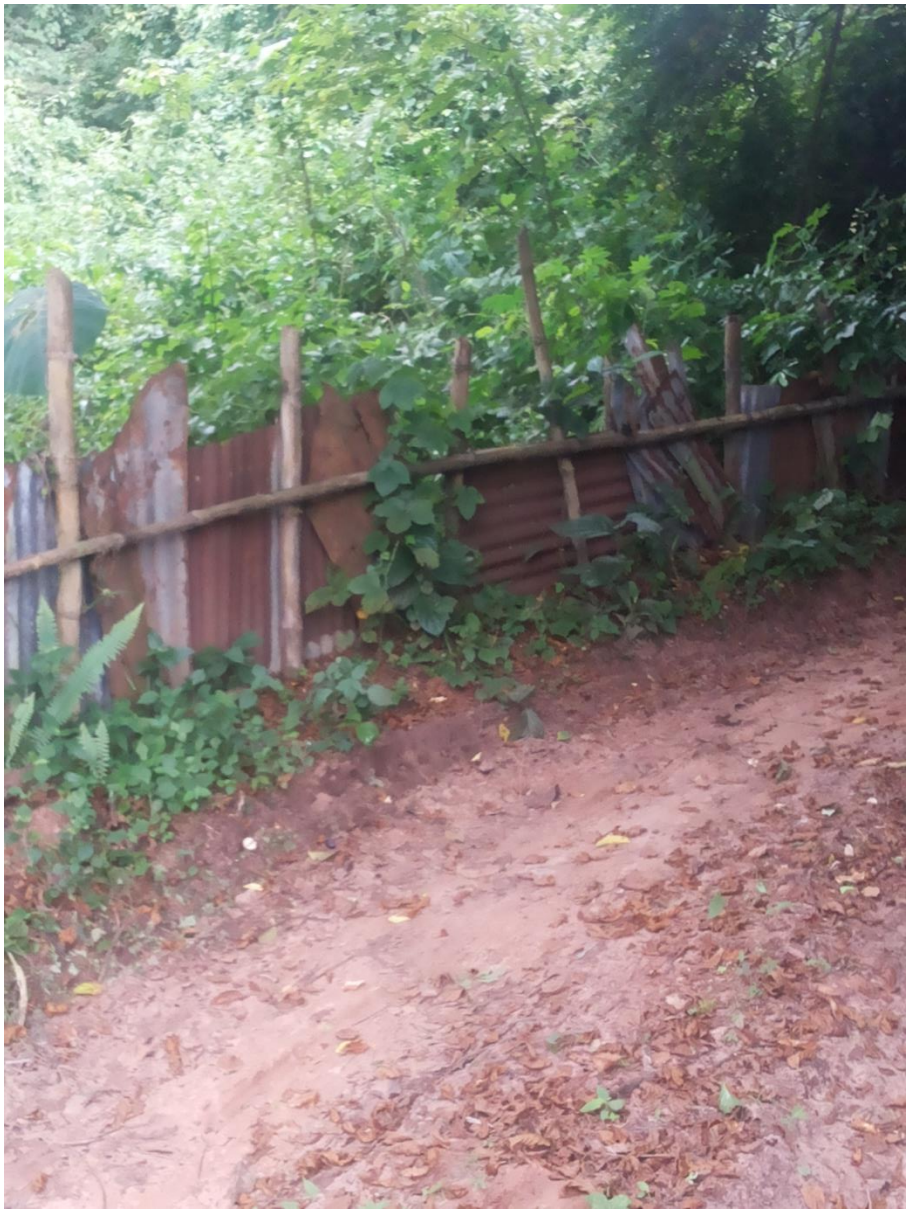
This respondent who owns a farmland on a slope uses this old method for holding his farmland together to prevent the top soil from washing away during intensive rainfalls.

Plate 6.4: Local use of tree trunks to prevent flooding and landslide at Agbamere community

Source: Author

A different local strategy is used to manage floods at another community. At Edeoha community, farmers use a combination of bamboo stems and old roofing sheets in holding soil together. This method involves building a perimeter fence along the slopes on the farmland. This method not only helps in preventing destruction from floods and landslides; it enables local farmers protect their crops from intruders and wild animals. The researcher observed that this method is also efficient in protecting farmlands located at paths often used by herdsmen and their cattle; it helps prevent conflict in some areas (Plate 6.5).

Plate 6.5: Perimeter fence built with bamboo and old roofing sheets to protect farmland



Source: Author

Local knowledge is mostly utilised in the Nsukka communities through the monitoring of weather elements and climatic conditions, prior to heavy rainfall and resulting flooding. This knowledge is valuable in preparedness for the impact of hazard and disaster. One strategy observed in different communities is that some local farmers sell off their farmlands which are in the open, to people who want to build houses. From the proceeds, they buy lands at the outskirts of the local community, in areas with some large trees and forests. The researcher did not initially see the logic in this, as such lands are usually far from the epicentre of local communities and transporting crops from such locations could be expensive. However, a local farmer at Umunedem community explained the reason for this:

> **Male farmer at Ede Oballa community (primary level educated, aged 67):**
> *'Most of us local farmers inherited their lands from our parents. With development and expansion, economic trees that protect crops from heavy rainfall and floods have been cut down […] the soil that has been farmed upon for generations become weak […] best option is*

to sell the land, buy cheaper one close to forest area […] economic trees and shrubs provide cover and strength for seedlings, unspoiled soil with good nutrients give rise to increased crop yields […] in the end, I end up with better income'.

This strategy highlighted by the respondent has been used by some farmers in different Nsukka communities such Ede Oballa (Plate 6.6) and Opi Agu. The researcher observed the use of local knowledge in the community varies. In all the communities of Nsukka, households use different methods to adapt to flood hazards. Two respondents from a group study of market woman and one respondent at a local bar mentioned the use of stones and palm kernel shells to manage the risk of minor floods in local households. The perceptions of different households towards heavy rains and the risk of floods lead to the different methods used for adaptation.

Plate 6.6: Typical farmland within a forest area at Ede Oballa

Source: Author

The researcher observed the importance of social relations and extended family units in all the communities in Nsukka. These relationships help in the management of flood hazards. At Umunedem, the researcher observed that brothers of the same father try to live close to each other in their family compound, along with their families. Their children grow up together not referring to each other as cousins, rather as brothers and sisters. These children attend school together, eat together and work on the farms of their fathers together. In a situation where one of the brother's farm (or any source of livelihood for that matter) is affected by environmental hazards such as floods, the other brothers and all the children come together to help in carrying out mitigation and adaptation strategies. At Ovoko, a respondent told the researcher that every male child in his kindred, between the ages of 10 to 21, belong to an organisation known as '*Obele Nwanne*', which translates to '*Little Brothers*'. He said the organisation was started by great-great-grandfather. The aim of the organisation is mostly to help in the cultivation of the lands owned by the kindred and to help in hazards mitigation and do menial jobs for households in the kindred. Such an organisation within the extended family unit goes a long way in the mitigation of hazards and adaptation to recurring or new hazards.

6.3: Erosion:

Erosion affects various communities across Nigeria. High intensity rainfalls, winds and seismic movements lead to washing away of soil, leading to continuing erosion in various communities especially in the Southern region of Nigeria. Soil and gully erosions in Southeast Nigeria constitute the greatest environmental threats for the region in the future. In the 1970s, it was estimated that about 1.6% of the Southeast region of Nigeria is affected by erosion (Igwe, 2012). There is a possibility that this percentage would have increased drastically with the recent impact of heavier rainfalls and resulting floods and landslides. There are major erosion sites across the states of the Southeast region. However, Anambra state is the most affected, with major erosion in town like Oko, Aguata, Agulu and Nanka (Abdulfatai et al, 2014). In Enugu state, erosion has affected communities. At Obollo Afor, a town located at the outskirts of Nsukka, a major erosion site exists which has cut off communities, destroyed farmlands, displaced families and led to loss of livelihoods. It has also contributed to landslides in that community (Ogbonnaya and Fukuoka, 2013). Out of the 17 Nsukka communities that participated in this research, respondents from 8 communities reported erosion as one of the hazards they face in their daily lives. The types of erosion faced by these communities are sheet erosion (top soil erosion) and gully erosions (Table 6.1). Top soil erosion is caused by flood water runoff. It causes original soil surface to be lost and leads to low crops yield as the nutritional quality of the soil is diminished. Gully erosion takes place over a period. The continuous impact of environmental and human conditions such as increased rainfall and deforestation respectively, creates a runoff that expands with time. It leads to loss of agricultural lands, displacement from houses and communities, and damaging of infrastructure (Desta and Adugna, 2012).

Table 6.1: Nsukka communities affected by erosion

COMMUNITY	TYPE OF EROSION	IMPACTS
Eha Ndiagu	Gully, Top soil	Loss of farmlands, property damage, displacement
Orba	Top soil	Loss of farmlands
Ede Oballa	Gully	Loss of farmlands, displacement
Agu Echara	Gully	Loss of farmlands, property damage
Opi-Agu	Gully, Top soil	Displacement
Agbamere	Top soil	Loss of farmlands
Akpotoro	Top soil	Loss of farmlands
Umunedem	Gully	Property damage, displacement

Source: Author

6.3.1: Perception of Erosions in communities:

Respondents from Eha Ndiagu, Ede Oballa, Agu Echara, Opi-Agu and Umunedem communities spoke about the impacts of gully erosions in their communities. At some of the communities, erosion has been a problem for a very long time. Some respondents remember the gullies starting up as large cracks noticed on farmlands and family compounds. Gully erosion has led to the displacement of extended families in some community, leading to loss of their cultural identity and heritage. At Opi-Agu community, an elderly respondent talked about the origin of gully erosion in his community:

> **Male respondent at Opi-Agu community (non-literate, aged 81):**
> *'I remember that people started to worry about erosions more frequently around the 1980s (…) back then, traditionalists advised people whose farms and compounds were showing signs of early gully erosion to abandon their farms and homes as the land is cursed or they are being warned by the gods; the gods were either giving them signs to move to better prospects or the gods were not happy with them'.*

From the response of this elderly member of the community, the erosion hazard has affected Nsukka communities for decades. For some of the respondents, the erosion affected them personally in the past. This was a case for a respondent at Eha Ndiagu community:

> **Male respondent at Eha-Ndiagu community (non-literate, aged 62):**
> *'My good friend and his family lived close to me, just at the side over there […] He is from Udi but he settled in our community and became a member of our community […] We were telling him to move from his property to another one that the erosion might spread to his house, but he insisted that he had a feeling the erosion would not spread to his house […] After about 13 years, the erosion caught up with his house, goats and chicken and totally destroyed his livelihood […] It was sad because it felt as if our land did not welcome him'*

The perception that higher entities may influence the impacts of natural hazards and cause misfortune in people's lives is quite popular. Some respondents from some communities believed that the erosions which affect their communities are signs from 'God'. They do not limit it to erosions, as most relate every natural or environmental hazard to the wrath of God. A local farmer and a woman whose husband is a local evangelist had this to say about the natural hazards in their communities and how 'God' influences these hazards:

> **Male farmer at Akpotoro community (primary level educated, aged 54):**
> *'It is not normal for the ground to keep breaking up; or rainfall which should nourish the earth for crops to grow, is washing the crops away instead. God is not happy with this community'.*
>
> **Female respondent at Eha Ndiagu community (non-literate, aged 60):**
> *'A lot of atrocities happen in this community. The rich grab land from the poor. God is destroying the lands of the wicked*'.

While these respondents believe higher entities are responsible for hazards in their communities, the perception that erosions are caused by environmental and physical processes was echoed by most of the respondents. Most respondents from the communities affected by erosions believe that increased rainfall, continuous farming and poor drainage are the leading causes of erosions in communities. For these respondents, a combination of several factors lead to erosions in communities. A respondent from Agu Echara believes increase in rainfall intensity in recent years is causing floods and contributing to erosion:

Male teacher at Agu Echara community (aged 53):
'*The rains are increasing in intensity every year. Heavier rains lead to floods, floods lead to washing away of the soil [...] Constant washing away of soil leads to creation of burrows, which could then lead to erosion over the years*'.

This respondent is aware of the contribution of rainfall to floods and erosion in the communities. The people in Nsukka communities believe a range of factors lead to erosion in their communities (Table 6.2).

Table 6.2: Perception of respondents towards erosion in local communities

Number of Respondents from communities affected by erosion	**Number of Respondents**
PERCEPTIONS	
Environmental hazards are signs from God	11
Erosions are punishment from God	6
Erosions are caused by natural and physical processes	38
Inadequate farming practices weaken soil and leads to erosion	11
Increased rainfall lead to erosions	40
Floods are becoming more frequent, leading to risk of erosions	37
Digging up lands to get soil for building roads and houses have increased the risk of erosions	28

Source: Author

6.3.2: History of Erosion in Nsukka communities:

Considering that Enugu state was part of the Old Anambra state (comprising Anambra, Imo, Enugu, Abia and Ebonyi states; created in 1976) and only got its 'independence' in 1991 (Obiozor, 2016), the researcher assumed that there would be rich history from the past on erosions in Nsukka, which is in Enugu state. This assumption was made bearing in mind that Southeast Nigeria is the region with the highest erosion occurrence in the country and there has been past research which suggests physical and anthropogenic factors have combined to cause erosions (Nwajide and Hogue, 1979). Bearing this knowledge in mind, the researcher sought the services of a gatekeeper (Malachi) who was his neighbour during the fieldwork period. The gatekeeper is an indigene of Opi-Agu (which is one of the Nsukka communities affected by erosions). The gatekeeper introduced the researcher to an aged member of his community, who then became one of the key respondents in this research. He is a titled chief and his status as 'Nze' is reserved for respected, credible members of Igbo local communities who are the backbones of their communities. Out of all respondents who participated in this research, he was the only one who could trace the history of erosion in Nsukka.

Key Respondent (Nze from Opi-Agu community):

'Erosions started in communities around ours in the 1970s; the Obollo Afor erosion problem might have started even earlier. It was around 1978 or 1979 that it started affecting us here […] During the time Jim Nwobodo was governor of Old Anambra state, he sent delegates to Nsukka, but they did not reach here […] It was only during the time of Sullivan Chime that I have witnessed work being done on erosions, at Obollo Afor, where they have built a big culvert and repaired a road destroyed by erosion for decades [...] Back in those days, the erosion was not causing any major problems; it was just a small nuisance for farmers, mostly'.

This respondent highlights that erosion has been a problem for the local community for a very long time and environmental factors have contributed to expanding erosions for decades. However, the respondent mentions government interest in mitigating the impacts of erosion, although not in his own community but in a neighbouring community.

6.3.3: Impacts of Erosion on Income and Livelihoods:

Respondents in the communities affected by erosions have suffered lost family lands and sources of income, destruction of properties and in some cases, have moved away from their homes. The type of erosion which affects each community determines its impact on the members of the community. For respondents in the 5 communities affected by sheet erosion (Eha Ndiagu, Orba, Opi-Agu, Agbamere and Akpotoro), the impact of this type of erosion is on their sources of livelihoods, especially farmlands. Top soil erosion affect farmers the most as it leads to the washing away of soil and nutrients. Two farmers, both from Orba and Agbamere communities respectively, had this to say:

Male farmer at Orba community (non-literate, aged 53):

'I specialised in growing and selling cassava, it is my area of specialty […] Two years ago, I lost my land to erosion and constant floods […] The soil became too sandy and I could not build moulds to plant my cassava stems on it anymore'.

Female farmer at Agbamere community (primary level educated, aged 47):

'My small maize farm was located on a slope, so flood water always washed my seeds away […] I abandoned farming after the continuous floods led to erosion that turned the soil sandy'.

For these two respondents, constant flooding weakened the soil composition and structure of their farmlands. This led to the farmlands becoming infertile and causing the respondents to lose their sources of livelihood. Communities that have been affected by this type of erosion have seen a decline in the number of local farmers. The depreciation in the productivity of the land pushes members of communities to abandon farming and seek other income sources. In the 5 communities, the respondents identified top soil erosion as a community hazard which has led to lost and diminishing incomes. For them, it influences the yearly output of crops available to households and at the markets. The respondents in these communities who were not farmers were not concerned about top soil erosion, but were more interested in the rising costs of foodstuffs. The impacts of sheet erosion and flooding lead to the scarcity of some foodstuffs in local markets. Even when such foodstuffs are seen, they are expensive. This leads to community members spending more money and incomes on food with each passing year. As a community member explained:

Unemployed male respondent at Eha Ndiagu community (secondary level educated, aged 66):

'Every year, food prices keep going up. People who sell foodstuff tell you it is erosion or flooding […] the sad truth is that whatever goes up in price in Nigeria never comes down'.

The issue of rising food prices being blamed on loss of farmlands through floods and erosions was experienced first-hand by the researcher during his fieldwork. After a rainy week in April 2015, the researcher went to the market on the weekend to buy foodstuffs. Tubers of yams the researcher bought in previous weeks at 200 Naira per tuber, were selling that weekend at 450 Naira each. When the researcher asked one of the yam sellers why she was selling her yam tubers at over twice the original price, she said:

'Rains have triggered floods, soil erosions and landslides that have washed away yam seedlings so there will be shortage of yams this year, so we have to keep back some yams and sell later in the year. Yam will become the food of the wealthy this year' – **Market woman**.

The researcher observed that farmers who sell produce at local markets use the excuse of environmental hazards such as increased rainfalls and erosion to increase food prices and create artificial scarcity. Known as price gouging, this situation occurs in the aftermath of emergencies or disasters. It is immoral and exploitative, as it makes things more difficult for people who are already suffering the impacts of an emergency or disaster (Zwolinski, 2008). Gully erosions have led to loss of economic trees (palm trees in particular) in Agu Echara Eha Ndiagu and Umunedem communities. Gully erosion has led to the destruction of expansive portions of lands where such trees had grown in the past. The impact has been the astronomical rise in the prices of products such as palm oil and palm wine. Gully erosions in Nsukka communities come with a sort of history. Respondents refer to their extended family homes and events from the past when talking about gully erosions, in the context of how gully erosion had affected them in the past. While most respondents have moved on from the impacts of the hazards, they still bear the scars of how their lives had been changed because of the impacts of gully erosions. Such impacts have included displacement of family and loss of infrastructure. This respondent from Opi-Agu community has this to say about how erosion has displaced his family:

Male respondent at Opi-Agu (secondary level educated, aged 63):

'In 1994, my brother and I had to move our families into rented accommodations in the rural community because the house which was started by our father, then completed by both of us, became threatened by gully erosion'.

For this respondent, he lost his family home and his family was displaced due to the impact of gully erosion. The respondent told the researcher that leaving the compound of his birth with his family made him feel like he belongs nowhere. Although he was in the process of completing a bungalow on a piece of land he bought at an area that is less prone to erosion hazard, he still feels that the displacement of 1994 had robbed his children of the opportunity to grow and bond with other members of the extended family. He put it this way:

Male respondent at Opi-Agu (secondary level educated, aged 63):

'*I have to take my children to visit relations faraway all the time and since they do not stay close to those extended relations, they will have difficulty knowing their roots'.*

This respondent was worried that his children have lost the opportunity of growing up with the extend family due to the impacts of erosion in his life and in the community. Environmental factors have led to expansion of gullies in local communities in Nsukka. However, the local people are also contributing to the expansion of erosion sites by digging up sand for building and construction (Plate 6.7). The excavation of sand contributes to expansion of the gully and one respondent believes that this is the case for his community. This is how he states the problem:

> **Male respondent at Eha-Ndiagu community (non-literate, aged 79):**
> *'We have been complaining and you know how erosion is; it starts small, but before you know it, it has expanded […] There used to be a road that passed through where that erosion goes through now […] It connected our community with Ikpa community, where we used to go and sell our chickens back in those days […] In 1984, levy was imposed on all sons of this community, home and abroad, to help build a culvert to prevent the early onset of erosion and help continue our businesses with Ikpa and other communities like Ede Oballa […] Members of our community passed the culvert with tippers during the early 90s, when selling sand started to became big business […] The culvert collapsed in the early 90s and that was continuation of the problem in recent times […]Erosion has expanded and affected communal farmlands, properties, houses, destroying economic trees as well'.*

Plate 6.7: An erosion site at Opi-Agu where people dig for sand sold to builders

Source: Author

Another problem created by the erosion risk is related to the local custom where Nsukka communities frown at women who try to buy land. This is the case of a respondent who lost the farming land her husband left for her before he passed away to sheet erosion, but could not purchase another piece of land as she has been told countless times that only males can buy lands in Nsukka communities:

Female farmer at Edeoha community (non-literate, aged 42):

'My husband passed away two years ago (2013) but left me a nice portion of land to continue farming on […] Floods led to erosions on portions of the land in 2013 […] I still plant on it till today, but I needed a larger portion of land to expand my farming […] I was not making as much income as I was making when the land was intact […] I have been in contact with three families since then to buy some land, but they all refuse to sell to me […] The elders in the families said my son should buy land not me […] He is only 6 years old; how would he buy land?'

The researcher asked one of the key respondents in the research why women are not allowed to own lands in Nsukka communities. Below are excerpts of his response with regards to this:

Key Respondent (Nze from Opi-Agu community):

'In Igbo tradition, the man is the head of the house, simple and short […] While the earth is a goddess, the elements and the sky are gods. The gods determine whether the earth shall be fruitful or not, so they rule over the earth […] This is the same in marriage and family life in my community and it applies to all of Nsukka town […] In my community, women cannot buy lands […] If they want to do it, they have to do it through men related to them by marriage or blood'.

For the female farmer at Edeoha community, the local culture makes her household more vulnerable to the impacts of hazards by denying her the opportunity of independently obtaining a portion of land which could help sustain her family.

6.4: Mitigation and Adaptation to Erosion Risk:

6.4.1: NEWMAP:

NEWMAP (Nigeria Erosion and Watershed Management Project) is a project funded by the World Bank in Nigeria. This project was initiated as the Nigerian government argued that there had been substantial revenue generated from the non-oil economy (2003-2007). This non-oil economy relies heavily on renewable natural resources. However, unsustainable land and water use threatens the future of these resources. This leads to adverse effects in the Nigerian Federal government's plan of non-oil growth, energy generation from biomass and hydropower, and food security in the near future. This will hinder the target of Nigeria becoming one of the 20th largest economies in the world (World Bank, 2011, pg. 2). NEWMAP is an 8-years project (2012 till 2020) aimed at tackling the menace of erosion in all the South-East states of Nigeria and some states in the South-South region. For Enugu state, five erosion sites are being worked upon: the 9th Mile corner gully erosion site in Udi LGA, Ajalli Owa gully erosion site in Eziagu LGA, Enugu-Ngwo gully erosion site in Enugu North LGA, Udi-Ozalla Road gully erosion site in Nkanu West LGA and Agbaja-Ngwo gully erosion site in Udi LGA (NEWMAP, 2017). These are the major erosions sites in the state. Resettlement plans and environmental impact assessments were put in place from the onset of the project. The project covers the towns of Udigla and Nsude towns respectively. It was surprising to the researcher that although erosions have affected people in Nsukka local communities, no respondent in the local communities had heard of the NEWMAP. The researcher interviewed a man who works at Nsukka Local Government Headquarters. He had never heard about the project or what the project is about:

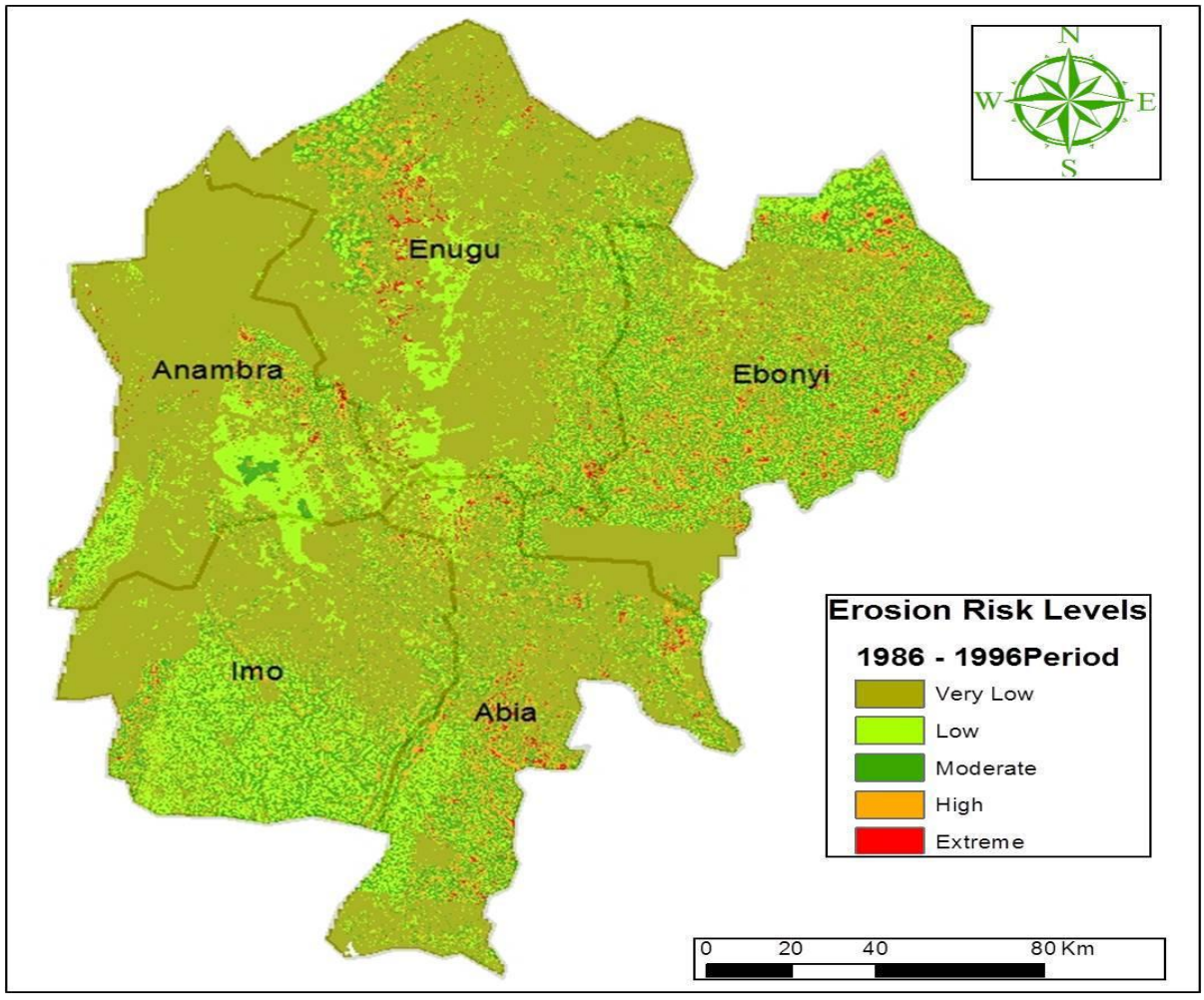
A secretary at Nsukka LGA Headquarters (secondary school educated):
'This is the first time I am hearing of a project like that; I have not heard of it before now'.

This project does not help in the mitigation of erosion hazards in rural communities in Nsukka. The researcher found that erosion hazard mitigation is done at the local and state levels of government.

6.4.2: State and Local Government Erosion Mitigation:

The cultivation of land to grow crops has been essential to the survival of local communities in South East Nigeria for generations. The dependence on land resources is necessary to ensure the survival of the dense population. However, this dependence has led to overuse of land from continuous farming on agricultural land throughout the year. According to data from research carried out by Anejionu *et al* (2013), remote sensing was used to show the erosion risk levels of states in South East Nigeria (Plate 6.8) and it was found that Enugu communities have high erosion risk levels.

Plate 6.8: Demonstration of the levels of erosion impacts across the five South-East states of Nigeria



Source: Anejionu *et al* (2013)

While it is not clear whether Nsukka communities are part of these erosion-prone sites, it is important to note that the Enugu government has done some major erosion mitigation work at Obollo Afor in Udenu LGA (a border town with Nsukka). In 2013, erosions sacked local communities in Udenu LGA of Enugu state, including Obollo Afor. The erosion sites could not be managed by the local government and the community appealed for the help of the state and federal governments (Premium Times, 2013). By the time the researcher was in the field in 2016, the state government had built some culverts to manage floods that lead to expansion of erosions at some areas at Obollo Afor. The researcher visited one of such erosion sites where culvert and drainages had been built (Plate 6.9) and a road that led to Abakiliki (capital of Ebonyi state) had been repaired (Plate 6.10).

Plate 6.9: Culvert built to check erosion at Ihamfo road in Obollo Afor

Source: Author

Plate 6.10: Road work in progress by the state government on the Ihamfo-Abakiliki road at Obollo Afor

Source: Author

The day the researcher visited these sites (Plate 6.9, Plate 6.10), he came across two local men on the road. They were collecting small taxes from motorbike riders on the road. They told the researcher that they were the local task force. The researcher had a brief discussion with one of the men after the researcher introduced himself; the second man turned down the request for a discussion. Though the discussion was brief, the respondent shared a few insights on the erosion and the mitigation work done by the government:

> **Male respondent at Ihamfo road, Obollo Afor (non-literate):**
> *'This road was completely cut off a year ago. No form of transportation moved across the road as the road was threatening to cut into two […] The state government have tried their best to work on the road and erosion, to ensure that there is a continuous link between Ihamfo and Abakiliki. This road provides a shortcut into Ebonyi state […] It is an important road for this community'.*

For this boundary community to Nsukka, the state government is taking measures to tackle erosion hazards. In communities in Nsukka, respondents told the researcher that the local government helped in mitigating erosion hazards. The researcher met a respondent at his shop in Opi-Agu community who confirmed that local government helps in the erosion management and his extended family had received such help in the past. He said his family received compensation from the local government after their communal land was affected by erosion through the actions of sand miners:

> **Male respondent at Opi-Agu community (primary school educated):**
> *'My extended family land was located not too far from the Uhere River […] People started mining sand for building from lands next to people's farmlands, ours included […] This caused soil erosion to expand to farmlands in the area, including ours. The lands had to be abandoned […] We formed a union with the three other families that had been affected as well and presented our case to traditional rulers, the local government council and prominent politicians in 2009 […] Each family was finally paid 4 million naira each in 2013'.*

This respondent's family and the other families were lucky enough to receive some compensation from the government. There have been situations where government have helped communities as a whole in mitigating environmental hazards (for example, the Obollo Afor erosion site). However, interviews obtained from the respondents in the communities about environmental hazards showed that there is usually no compensation from the government when single families are affected by such hazards. The researcher assumed that there must have been some power play and local politics involved which influenced the compensation received by the families. This assumption was confirmed by the researcher as he later told the researcher that 'he heard' that a member of one of the families was an early forth-republic Nigerian senator. Although families in local communities rarely receive compensation on erosion losses, the benevolence of community members has helped some people recover after the impact of erosion. According to a respondent from Umunedem community, he gave a portion of his land to his cousin and his family to grow crops for their daily consumption after they lost their farming land to gully erosion:

> **Male respondent at Umunedem community (primary school educated, aged 42):**
> *'Two years ago, the land my cousin inherited from his father was destroyed by the onset of gully erosion […] For many years, I had been advising him to sell the land to sand miners due to its location, but we always quarrel as he said the land is his heritage and would never be sold […] He insisted that he had a feeling the erosion would not spread too much […] I had to give him part of my own farmland to grow crops, as we depend on what we grow to feed our families. We do not make much income as 'okada' riders'.*

In this particular situation, the social capital (in the form of relationships) helped the respondent's cousin mitigate the impacts of erosion hazard.

6.4.3: Communities Mitigation and Adaptation to Erosions:

Local communities in Nsukka use a variety of land use management methods to mitigate erosion hazards. Land use management involves all processes and methods used to efficiently use land resources to ensure sustainability of the land (Enemark, 2007). At Opi-Agu community, the respondents talked about the role of family elders in coordinating land use management. According to one respondent, his family and people from his kindred had always suffered the issue of minor erosions on their farmlands for generations. His family had always owned kindred lands at various locations within Opi-Agu and every family within his kindred had to grow crops at a farmland chosen by the elders in his kindred, every specific year. He gives his reasons for this:

> **Male farmer at Opi-Agu community (secondary level educated, aged 56):**
> *'My father's grandfather, who was a devoted aide to his Igwe back in those days. The Igwe gave him a large expanse of land in this community as a gift for his loyalty. This is according to my father and it happened almost two centuries ago. My extended family has depended on that land for a long time […] sheet erosion has been affecting portions of the land in recent years […] the elders in my 'umunna' decide what portion of the land should be planted upon by the families before the rains come each year in order to allow other portions of the land to recover […] nobody questions the decisions of elders in my umunna'.*

The role of elders in the Igbo tradition is very important. In family circles, the 'umunna' includes all the male members of the extended family. The elders in the 'umunna' are usually older members of individual households; they are usually the ones who make family rules and regulations. There is utmost respect for elders in African culture as the signs of grey hairs signify wisdom and demands respect (Conton, 1965). The Igbo have a saying that '*he who listens to the elders is like one who consults the oracle'*. As custodians of wisdom, elders can lead families and communities and have

legitimate powers to make local laws. As highlighted by the respondent above, the elders are the law in his family. With their powers, they ensure that planting rotation gives the land time to recover from the impact of sheet erosion. A second mitigation strategy for communities affected by gully erosion was observed by the researcher, throughout Nsukka. Local authorities create rules that prevent people from going to farmlands close to erosion sites, no matter how small the erosions are. The local people are barred from planting crops close to erosion sites. According to a respondent at Umunedem community, anybody caught trespassing an erosion site to plant crops could be reported to the local chief and made to pay a fine.

> **Male respondent at Umunedem community (non-literate, aged 74):**
> *'Our Igwe has warned people not to go close to the erosion site at the Obiuzor clan. It is not a big erosion site but it might keep expanding if people plant crops close to it […] you can be made to pay a fine for disobeying the Igwe's orders'.*

The mitigation strategy of abandoning farmlands due to erosion has its advantages. Abandoning farmlands gives the soil time to recover from the impact of continuous farming. In some cases, the lands are ecologically restored over an extended period, which could be up to decades (Haddaway *et al*, 2013). This method of abandoning farmlands next to erosion sites was observed in Umunedem, Agu-Echara and Opi-Agu communities. Respondents in communities affected by top soil erosion highlighted the importance of crop rotation as a reliable way of mitigating erosion hazards. What the researcher found interesting is that farmers in the local communities affected by sheet erosion understood the concept of crop rotation, even without any education. Out of the 16 farmers interviewed at the communities affected by top soil erosion, 11 of them told the researcher that they had practised crop rotation in the past while some are still practising it:

> **Female farmer at Akpotoro community (primary level educated, aged 39):**
> *'I practise crop rotation and because I have a small portion of land, I have to do so to utilise the nutrients in the land more efficiently […] If I keep planting the same crops every year, the soil will get tired'.*

> **Male farmer at Orba community (primary level educated, aged 63):**
> *'Last year, I was a cassava farmer. This year, I am a maize farmer. Practising crop rotation keeps my farmland healthy […] I am an expert in growing different crops, which I think is part of the reason I am a successful farmer'.*

These respondents recognised the importance of crop rotation in ensuring the sustainability of their farmlands. However, the researcher observed that some commercial farmers in these local communities rely on growing specific kind of crops. Some grow and specialise in maize cropping, others in cassava cropping and yam cropping. While this specialisation helps farmers focus on becoming experts in the cultivation of specific crops, it could deplete the nutritional quality soil, enhance degradation of the soil and make such soils more vulnerable to the impact of erosions. Apart from preventing soil degradation and reducing the risk of erosion, crop rotation also improves soil's organic content and soil structure. This promotes the retention of water and nutrients in the soil. A good soil structure improves water drainage (after heavy rainfalls) and reduces the risk of floods and surface runoff that could lead to erosion of the soil. All these contribute to profitable farming in the long-term (Act Alliance EU, 2012). Respondents in Nsukka communities told the researcher that they gathered the knowledge about crop rotation by watching their parents, grandparents and extended relatives, from an early age:

Male farmer at Orba community (non-literate, aged 44):
'I lived with my grandmother till I was 16 years old. She always took me to the farm with her […] By watching her, I learnt all the practices and skills needed to become a successful farmer'.

Female farmer at Agbamere community (secondary level educated, aged 47).
'As a young girl, I went to my grandfather's lands with my cousins on the weekends. I learnt practises like making moulds, preparing local manure from animal dungs, crop rotation and tilling from my big cousins'.

In Nsukka communities, farmers who practise crop rotation tend to be commercial farmers. However, it is important to mention that there were subsistence farmers who grow crops to feed their families as this helps reduce the amount of money spent on the purchase of foodstuffs from local markets. The subsistence farmers' practise of intercropping has a positive impact and according to one of the respondents, the focus should be on getting the best out of agricultural lands (Plate 6.11). According to him, planting different crops at the same time provides more food for households who depend on the farmlands for what they eat:

Male respondent at Opi-Agu community (university educated, aged 64).
'Erosion will affect farmlands, whether you do crop rotation or not, that is my belief. The power of nature is greater than the efforts of man […] it is better to make effective use of the land and take care of the family while you can because no one is sure of tomorrow'.

Plate 6.11: Subsistence farmland at local household

Source: Author

The farmland in Plate 6.11 belongs to a respondent and is located behind his house. It shows a mix of maize, cocoyam and cassava crops all growing together. This is efficient for subsistence farming and provides food for households in Nsukka communities. It is important to mention that intercropping does not only provide multiple food crops for local families throughout the year; it also ensures arable land is efficiently used. The process also produces crop residues which help enrich the soil by providing organic matter and nutrients (FAO, 2001). There is no concrete evidence to suggest that intercropping has a long-term devastating effect on soil. It is important to note that research has found that intercropping might be beneficial in soil runoff and erosion control. Research by Zougmore *et al* (2000) on the impact of cowpea and sorghum intercropping in erosion control showed that planting both crops together helped reduce soil runoff by 20-55%, so intercropping for maximum land utilization and yield is a good idea especially for people in local communities.

6.4.4: The Bamboo Plant:

The bamboo plant is highly revered in Nsukka communities affected by gully erosion hazards. For the respondents who had been directly affected by gully erosions, the bamboo plant is an essential component for adaptation and mitigation in their communities. Bamboo is a grass that grows across countries in Africa, Asia and America. With over a thousand species of the plant covering about 18 million hectares of forest ecosystems across the world, it is a widely-distributed plant. Bamboo is a natural resource that has been used in construction, building and crafting in various communities for generations. In developing counties, it has various traditional and cultural uses. In many communities in different countries, the plant is an essential component of soil stabilization and erosion management strategies (UNIDO, 2009). In Africa, bamboo has been used since the pre-colonial times and has been used extensively in different states of Nigeria for various purposes (Odeyale and Adekunle, 2008; Ogbanje and Diko, 2013). Respondents from five Nsukka communities talked about the importance of bamboo in their daily lives, history and culture. According to some respondents, their earliest memories of the bamboo plant dates back to their childhood days. For one of the respondents, he had fond memories of the bamboo plant as it was the material used to make his first toy:

> **Male respondent at Agu Echara community**:
> *'When I was about 11 or 12 years, my father gave me his 'oja'. My father used to be a member of a cultural and masquerade group when I was growing up but he stopped participating in it after some years […] He was the one who blew the 'oja' for his cultural group […] The 'oja' is made from bamboo stems'.*

The 'oja' is a traditional Igbo flute. It is a musical instrument that accompanies traditional dances and events and it can be owned by anyone in local communities. The researcher also remembers travelling with his parents and siblings to his own hometown in Anambra state as a young child during festive seasons and trying to learn how to blow the 'oja' from older relatives in the village. Another respondent's first memory of bamboo was as a bed at his parents' house.

Plate 6.12: '*Oja*' – Igbo flutes

Source: *www.motherlandmusic.com*

Some respondents remember how bamboo plants helped slow the expansion of gullies in their communities. For them, the gully erosions experienced in their local communities would have been worse than they are at the moment, if not for bamboo plants that were planted decades ago (Plate 6.13). Some respondents had these to say on the importance of bamboo in community erosion management:

> **Key Respondent (Nze from Opi-Agu community):**
> *'If not for our efforts in the past, the erosion would have been worse […] we saw the land was getting weak and planted bamboo together with other food crops to help in controlling erosion in the past, that is why more families are not affected […] it's the bamboo plants that help wedge it (erosion) a bit, although it takes a diversion where the bamboo doesn't grow and keeps spreading'.*
>
> **Female respondent at Ede Oballa community (secondary level educated, aged 47):**
> *'When my grandmother was alive, she told me that bamboo had been the strength of most communal lands in this community […] It has held soil together to prevent erosions in most areas'.*

Plate 6.13: Gully erosion site located a few yards away from a house at Umunedem community of Nsukka, showing bamboo plants planted in the past for erosion control.

Source: Author

A respondent whose house is located not so far from the gully above told the researcher that he does not want to leave the house and surrounding land. According to him, the house and land is part of his heritage, as the house and the surrounding land were inherited from his father, who in turn had inherited it from his own father. Although he admitted that some local chiefs have warned him to begin making plans to relocate to another part of the community, he said he neither had the will nor the resources to make such relocation. This increases the vulnerability of his household to this hazard:

> **Respondent in Umunedem community affected by erosion (non-literate, aged 69):**
> *'I cannot leave this land. My father and grandfather were buried here […] I grew up in this house, my children were all born here […] If I leave this land, the land of my fathers, I will become a man with no home […] One does not just wake up and depart from the home he has known all his life […] It involves a lot of things'.*

The traditional perception of this respondent that he should not leave his ancestral family home puts him and his family at risk. If he had the financial capacity, he might not need too much persuasion to leave the family land, as financial resources would make him open to options.

6.5: Heatwaves and Rising Temperatures:

Climate change poses a continuous threat to the sustainable development in all the countries of the world. Its impact will lead to diminishing water resources, poor health and inadequate food supply especially in communities of Africa, Asia and the Americas. Local communities continue to be vulnerable to the threat of climate change. In Africa, climate change will lead to low crop yields, increased food insecurity, changes in rainfall patterns, desertification, increased droughts and extreme weather events (OECD, 2015). Such extreme events in Africa include heat waves which have caused health problems, food shortages and lack of water (Ceccherini *et al*, 2017). Temperatures have risen by over 0.5% in various parts of Africa since the past 50 to 100 years, leading to more intensive heat waves. A higher percentage of African countries are experiencing increased heatwaves throughout the year (Russo *et al*, 2016). It has been projected that under a high emissions scenario, average temperatures in Nigeria would have risen by over four degrees Celsius between 1990 and 2100. This will contribute to continuous heat waves across the country for a long time (WHO, 2015: 1). This scenario is already playing out in Nsukka communities. The researcher experienced the intense heatwave of 2015 while he was in the field. Days were so hot and nights were terrible. Throughout the research process, the researcher found out that all the respondents agreed that the rising heat wave is a threat to health of local people. According to one respondent in Agu-Echara community, the heat is unbearable for him and his family and they had resorted to sleeping outside the balcony of their house:

> **Male teacher at Agu-Echara community (university graduate, aged 51):**
> *'The dry season is so hot […] In fact, we usually sleep on mats and mattresses on the balcony of the house because the heat inside the house is unbearable'.*

For some other respondents, the heat wave has not only made them sleep outside their homes; it had also contributed the increased risk of malaria from mosquito bites. One of the market women from a focus group discussion believed that this is the case for her family:

> **Market woman from focus group (non-literate):**
> *'The heat is too much. My children and I spend more time outside the house than inside […] The zinc on the roof collects the hot sun and heats up the house […] We sleep at the veranda of the house to avoid the heat, but mosquitoes always sing in our ears […] My two youngest children have suffered from malaria in the past 6 months'.*

A key respondent in the research told the researcher that the heat wave in Nsukka communities was making people ill. He went on to say that the outbreak in meningitis in Northern Nigeria was due to dry winds from the desert and increased temperature and heat waves:

> **Key Respondent (Former Permanent Secretary in Enugu State Government):**
> *'Anytime the weather is hot like this, there is risk of an outbreak of meningitis […] If you notice, every year is getting hotter than the previous year […] Meningitis outbreak is now a yearly occurrence, especially in the North […] One day, the epidemic will reach us here in the South, if this weather continues like this yearly'.*

The researcher was in the field at Nsukka when the federal government announced that meningitis vaccines would be delivered to communities for free, starting from the Northern states, as the northern states were mostly affected by the disease. By the time the vaccines got to Nsukka communities, the researcher was preparing to come back from the field. However, when the researcher finally found a chemist where he could take the vaccine, it turned out that most of the chemists were selling the vaccine at the rate of a thousand naira per dose. This was against the regulation and the researcher had a bitter exchange with the chemist, where he threatened to alert the local government authorities of the chemist's extortion of the local people. The researcher did not get the vaccine and knew no one to

report to. This was the case at that time for members of Nsukka communities. The heat wave had contributed to the outbreak of meningitis and although the vaccines were readily made available to various communities across Nigeria, chemists were selling these vaccines. Many families ended up not getting the meningitis vaccines as they would rather use the little income they get to provide food for their families than pay for what government had provided freely to them. According to shop owner during a conversation:

> **Shop owner at Odenigbo Roundabout, Nsukka:**
> *'My brother, we are all fine […] Let the greedy people who always want to make money from things which are free continue. Let us feed our families first [...]* ***O na-abu asi nwata wuba ahu, o saba afo ya****'.*

The Igbo saying which has been highlighted from the response of the shop owner above translates into: ***Tell a small child to take a bath and he/she keeps washing his/her belly*****.** This is a popular saying across all Igbo communities. It signifies that even a small child recognises the importance of having a full stomach before considering other livelihood options. In Nsukka communities (and other Igbo communities, including the researcher's community), local people are interested in catering for their households first before considering other things. In a situation where they are forced to use the little income they have for other purposes (like in this situation, to buy vaccines which should be free), they would prefer to take care of their families first as there is no evidence of sickness yet from the epidemic. Such situations could increase local people's vulnerability to health hazards. The need to provide food for the family first may not be limited to Igbo communities, as Nigerians in general believe in the need to survive daily, by striving to have food on the table. There was a fresh outbreak of meningitis in Northern Nigeria in early 2017. A contributing factor to the recent outbreak may include the mishandling of vaccines and corrupt strategies of those who were entrusted to distribute the vaccines in 2015 (this assumption is made from the researcher's experience in 2015). As at early April 2017, there have been almost 4,000 suspected cases and 438 confirmed deaths due to meningitis in Northern Nigeria. The Nigerian government commenced the distribution of vaccines on the 5th of April 2017 (NCDC, 2017). However, it is important to mention that this batch of immunisation programme has been riddled with reports of corruption. Various Nigerian blogs reported that batches of the vaccines have been stolen and resold by officials by the 18th of April. This was not confirmed or denied by the Nigerian government at the time the researcher was writing up this portion of the thesis.

When the researcher asked the respondents if they knew the reasons for the constant hot temperature, most of the respondents just blamed it on 'changing weather'. The respondents who understood that climate change is responsible for the hot temperature and heat waves were the key respondents and the university graduates among the respondents. The concept of climate change is not understood by most local people in communities in Nsukka. Two respondents from two different Nsukka communities summed up the impacts of climate change (intense rainfalls, floods, increased erosions, heat waves) from religious perspectives. One of these respondents is a pastor and the other is a traditionalist. According to the pastor (who is also a teacher at a primary school at Alor-Uno community):

> **Local pastor at Deeper Life Church and teacher in a private school, Alor Uno community:**
> *'I believe all these things that are happening are signs of the end times […] From the way countries and communities are fighting each other, to even the floods and extreme weather conditions we are facing […] It is written in the book of Mark (in the Bible) that when the end draws near, nations will rise against nations. Earthquakes and other extreme weather*

situations will shake this world […] We are being punished for our sins by God […] We need repentance in this world before Jesus Christ comes'.

For this respondent, the changing climate signifies that the world will come to an end someday. While this is unbelievable for an atheist, a follower of another religion or an enlightened scientist, it is the bedrock of faith for Christians. Such perceptions shape people's faith. Educated and enlightened members of communities understand the concept of climate change and how it shapes our world. In the case of the pastor above who is educated and a teacher, the researcher began to wonder whether knowledge passed to his students would be from a religious or reality perspective. For the non-literate in the local communities, this information about the problems of the world being because of 'sin' may only increase their vulnerability to natural hazards. The traditionalist had a different perception on the impact of climate change. He believed that accepting the ideologies of the missionaries made communities vulnerable to the impact of hazards.

Local bar owner at Umunedem, Ameni community:
'All these things have been happening to our environment because we abandoned the ways of our forefathers a long time ago and adopted the ideas of the white man […] We are not white men, are we? […] Our parents and grandparents told us that where land opens to swallow people's houses and farmlands or water washes away people's livelihoods, it is a sign of curse from the gods […] We abandoned the ways of our forefathers […] ***'Ani'*** *has cursed us as it is no longer on our side'.*

It is important to note here that the respondent used the term 'Ani' to signify a being, an entity and living thing. In the Igbo language, 'ani' or 'ala' (depending on the dialect) translates to the ground, soil or the lands in general. However, in cultural and traditional Igbo beliefs, 'ani' or 'ala' translates to the Goddess of the Land. This second translation is why the respondent refers to the land as a living entity, who has cursed the community for abandoning the old ways and adopting the ideologies of the missionaries. To better understand this perception, it is important to understand the Igbo worldview. A worldview as defined by Nwoye (2011) refers to *'how people perceive and explain their world, or the way things are or change in their environment*' (Nwoye, 2011: 306). Igbo perception of the universe is made up of the sky, the earth, the water and the ancestral. In Igbo cosmology, the earth is the dimension of the universe where human beings, evil spirits, animal spirits, guardian spirits of various professions and Earth Goddess inhabit. The Earth Goddess (Ani) takes care of the earth. The lands, hills, forests and rivers are believed to be controlled by Earth and Water goddesses respectively. A lack of reverence to these deities is believed to lead to disaster in Igbo communities (Achebe, 1975; Ejizu, 1987; Kalu, 1992; Nwoye, 2011).

6.6: Conclusion:

This section of the chapter has presented the findings from Nsukka communities in relation to natural hazards. The perceptions of the local people have been shown to influence the decisions the local people make when faced with natural hazards. From the findings, it can be seen that members of Nsukka communities struggle in the face of ever-present natural hazards. While these hazards make communities vulnerable, adaptation mechanisms have helped the local people survive daily. The importance of livelihood assets such as the family was also highlighted in the section. The next section deals with man-made hazards that affect Nsukka communities.

7.0: HUMAN-INDUCED HAZARDS IN NSUKKA COMMUNITIES

7.1: Introduction:

The impacts of natural hazards can cause widespread devastation in communities. However, hazards which are caused by human errors and negligence increase the vulnerability of communities to the impacts of natural hazards. Human-induced hazards could lead to man-made disasters and create conditions which lead to increased vulnerability to natural hazards. Human-induced hazards and disasters occur when human negligence and errors lead to human suffering and environmental depreciation (Sawada *et al*, 2011). These types of hazards can be categorised into technological and sociological hazards. Technological hazards lead to disasters such as industrial accidents, structural failures, environmental pollution and nuclear disasters. Sociological hazards lead to disasters occurring from strong human motives such as conflicts, riots and wars (Kapucu and Ozerdem, 2013: pg. 12-13). Conflict is one of the hazards faced by communities in Nsukka. It is important to note that hazards and disasters have social significance for people in terms of vulnerability. Socio-economic conditions can reduce or exacerbate the vulnerability of communities to hazards and disasters. Such conditions include health issues, level of literacy and education, income levels, essential amenities and infrastructure (Nirupama and Armenakis, 2013). In some perspectives however, these socio-economic conditions could become hazards. A lack of adequate roads could become a hazard which leads to motor accident disasters; low income levels could become hazards as people would not have monetary resources to help in mitigation against other hazards. In Nsukka communities, conflicts between local farmers and migrating cattle herdsmen from Northern Nigeria are on the rise. These conflicts have led to loss of lives and livelihoods and displacements. Lack of resources such as portable drinking water causes problems for members of Nsukka communities. They also face challenges in their daily lives as bad roads lead to transportation difficulties and cause accidents. These hazards are caused by human factors such as negligence and corruption.

7.2: Conflict Hazards in Nsukka communities:

In the early hours of the 25th of April 2016, over 500 Fulani herdsmen attacked Nimbo community. This community is located next to Nsukka. Over 45 members of the community lost their lives in the attack, with scores injured and taken to hospitals in Nsukka. The reason for the attack was that the community refused to give up their communal farming land to the herdsmen escaping drought and desert encroachment in the North. Such attacks have been taking place in other states as well such as Benue and Kogi states (Vanguard, 2016). There has been serious criticism on the actions of herdsmen across the country. The members of Nimbo community have been traumatised by the invasion of the herdsmen and livelihoods have been lost as local farmers fear to go and harvest their crops from their farmlands; there is fear around the community that such as event might reoccur (The Sun, 2016). The fear has spread to other communities as well. Nsukka communities are affected by such conflicts as well. For one of the respondents, his brother and family ran away from Nimbo community to his house in Nsukka after the massacre, leaving behind all his property. These are excerpts from the interview with the respondent:

> **Male respondent at Opi (secondary educated, aged 47):**
> *'My stepbrother owned a big provision and chemist shop in Nimbo […] After the attack that morning, he gathered his family and drove down to my house. He swore never to return to the community. His children were crying profusely, the shock of what happened had traumatised them […] We are looking for schools for his children here in Opi at the moment […] He is searching for a house to rent for himself and the family; he is also looking for a new location to continue his business […] His children do not even want to hear the mention of Nimbo […] My wife and I are supporting him and his family at the moment until they find their feet'.*

Other respondents talked about how minor conflicts have occurred between Fulani herdsmen and farmers in Nsukka communities in the past. While those conflicts had not led to bloodshed, they had led to destruction of people's livelihoods vis-à-vis farmlands. This is what this respondent from Obukpa said:

> **Female respondent at Obukpa community (secondary educated, aged 33):**
> *'My father and his brothers owned a large portion of land they inherited from my grandfather […] Although they do other jobs that is not farming, we used to go and farm there from time to time […] To grow cassava, corn and vegetables […] These Fulani men were always taking their cattle to the farmland […] My father and uncles complained to the Igwe […] The Igwe instructed some youth to put temporary barriers around farmland but after some months, my uncle found out that the barriers had been destroyed […] The cattle ate the corn and vegetables we were waiting to harvest […] My father and uncles sold the land and we lost that food source for the extended family'.*

For this respondent, her family lost a vital source of food due to the menace of the invading herdsmen. Most families in Nsukka communities rely on subsistence agriculture to cushion the impacts of rising costs of food producte in the market. Although the family of this respondent got money from selling the land, they lost an important source of food. Another respondent told the researcher that some youth groups in his community had banned Fulani herdsmen from grazing their cattle in some areas of their community as there have been conflicts in the past between some members of his community and some herdsmen:

> **Male business owner at Agbamere community (primary level educated, aged 52):**
> *'Sometime in 2015, some Fulani herdsmen grazed their cattle on the farmland of a prominent member of our community known as Nze Obiesika. The cattle destroyed his large plantation of maize and cocoyam […] Some youths of the community beat up some random herdsmen and killed one of their cows because of the incident. This led to a retaliating fight where the community youths and the herdsmen were injured […] The Igwe was angry and banned the herdsmen from grazing on people's lands. He finally gave them a land that used to be an evil forest in the past and nobody uses anymore, for them to graze their cattle upon […] Conflicts still occur from time to time'.*

There is growing concern among members of Nsukka communities that the conflicts will continue to be on the rise in communities. Some respondents have attributed this to increased insecurity and the political climate in the country.

> **Male farmer at Agbamere community (non-literate, aged 61).**
> *'The reason why these Fulani herdsmen are just entering communities and invading farmlands is because their brother is in power […] They feel they own the country'.*

The respondent's statement that 'their brother is in power' is with regards to the current Nigerian president, Mohammadu Buhari, who is a Fulani man. Going around the various communities during his time in the field, the researcher observed that although people were looking forward to a new president from the opposition party in the country, there were concerns that the prospective president is from the North. Ethnic divisions, religious conflicts and political favouritism are some of the reasons why foundations of distrust have been built between the North and the South of Nigeria. While the researcher saw no reasons why some members of Nsukka communities would have been bothered about the new president being a Fulani man from the North, what was evident was that there was a sense of uncertainty among the members of Nsukka communities on the emergence of a Northerner as the president at that time. There have also been reported conflicts between Fulani

herdsmen and farmers in other parts of Enugu state as well as other states of the country, especially in the Middle-Belt states of Benue and Taraba. Hundreds of people have lost their lives to these conflicts between the herdsmen and local communities. The situation has been acknowledged on a global scale as the Human Rights Watch estimated that about 3,000 people have lost their lives to these conflicts in the Nigerian central region since 2010 (Ubelejit, 2016). These conflicts have led to increased interest of members in Nsukka communities in the issue of Biafra. The ideology of Biafra is the independence of the South-East region of Nigeria. The first call for the independence of the Southeast region of Nigeria led to the Civil war (Biafran War) of 1967. In recent times, an organisation called the Indigenous People of Biafra (IPOB), under the leadership of Nnamdi Kanu, has led calls for the Nigerian government to give independence to the people of Southeast Nigeria. By branding this organisation a threat to national security and arresting its leader and trying him for treason, old wounds of the civil war were reopened and there are growing numbers of pro-Biafran sympathisers in Southeast Nigeria. There have been clashes between these sympathisers and security forces that have led to injury and death (Gaffey, 2015; Freeman, 2017). For respondents in some Nsukka communities, the country should be divided so that everybody will stay in their own regions, as the association of the different ethnic tribes in the country has only led to bloodshed and conflicts from the past till the present. A respondent puts this into perspective:

> **Male local government worker at Edem community (primary level educated, aged 55):**
> *'It is not today that the Northerners have wanted to kill us off […] From the time of the Biafran War, to killing Christians in the North, to Boko Haram and now Fulani herdsmen […] They should divide the country so that everybody will go their own way […] We (South easterners) and these people (Northerners) are not the same in any way […] From religion to culture and ways of life, we are very different'*.

A key respondent goes further to accuse the British colonial masters who amalgamated the North and South of Nigeria into one country in 1914, of favouring the Northern region over the Southern region and indirectly contributing to the conflicts still experienced in the country today. He also referred to what happened in the Biafran War, where the British government was accused of supplying arms and ammunition to the Nigerian government which was used to kill the Southerners:

> **Key Respondent (Nze from Opi-Agu community).**
> *'We and these people are very different. The radical ones have no regard for human life […] Imagine killing people for their own farmlands to graze your cattle upon […] It is trampling on people's indigenous rights […] I am a strong supporter of Biafra […] They should give us our independence so we can regulate how these people (herdsmen) enter our communities. We can ban then if we want to […] They feel privileged […] It is fault of the British who merged different cultures together for their benefit and the benefit of the Northerners who served the colonizers […] Do you know they supplied the Nigerian army with weapons during the Biafran War?*'

While one is tempted to dismiss these accusations as just hearsay, it is important to mention that different publications have attested to these accusations (Curtis, 2007; Smith, 2014) as Britain wanted to protect personal interests during the Civil War. Some other respondents also echoed the points put across by this key respondent. In a group discussion with local men at a bar in Onuiyi community, the researcher found out that most of the discussants preferred the state government to ban the Fulani herdsmen from their community. According to two of them:

> **Unemployed male at a bar in Onuiyi:**
> *'These people are unpredictable. Someone whom has been allowed to move about freely in your community but wants to forcefully take what rightfully belongs to you cannot be trusted'*.

Male community school teacher:
'They should stay in the North there and search for food for their cattle. We cannot trust these people'.

Going through these responses, one begins to see a pattern. The issue of climate change affecting the North has led to migration to the South, where conflicts have occurred, leading to ethnic distrust and a sense of insecurity. This is a typical example of a complex emergency. A complex emergency is caused by a combination of natural hazards and human-induced hazards. It is characterised by displacement of populations and large-scale movement of people, violence, loss of lives and livelihoods, damage to economies and security risks to members of communities (WHO, 2002). Unfortunately, Nsukka communities have no mitigation or adaptation strategies for managing these conflicts in their communities. The respondents rely on the government to intercede on their behalf and ban the herdsmen from going into farmlands. One of the respondents suggested that the local government could allocate a large portion of land at the outskirts of the community as a settlement and grazing land for the herdsmen and their cattle.

Female teacher at Agbamere community (university educated, aged 42).
'If I were to advise the government, I would suggest that they give the herders a portion of land outside the community where they can always use […] There are lots of forest lands at the outskirts of this community that no one own; these are community lands […] Government can give them such lands since it is not their fault that they have to migrate down South […] It will even make it easier for government to monitor their activities'.

7.3: Resources and Amenities:

Inadequate resources and amenities may be classified as socio-economic conditions that make people more vulnerable to hazards. However, respondents at Nsukka communities classified these as hazards which affect their daily lives and they determine how other hazards impact their lives. From the research, the hazards which fall under this category can be classified into two: low minimum wage and inadequate water supply.

7.3.1: Low National Minimum Wage:

While low wages and salaries cannot be categorised as hazards per se, the definitions of hazards as perceived by respondents in Nsukka communities meant that hazards are '*conditions within and outside this community which make carrying out our daily business become a struggle in the community and outside of it as well'* (according to Nze Titus Ibekwe, a key respondent). Following this understanding of hazards, a good proportion of respondents categorised the minimum wage as a hazard, as it is insufficient and is not enough to help tackle their vulnerability to other hazards. The researcher would still categorise low income levels and wages as socio-economic conditions but the research is about trying to understand the perceptions of the local people and not his own perceptions; hence the need to present the perceptions of the local people. The minimum wage the Nigerian government at all levels (Federal, State and Local governments) is required to pay a government worker is N18,000 per month (which is the equivalent of about $60). This amount is very small compared to the prices of food and other commodities. In Nsukka communities, people who work in government and school have problems managing their families with such a meagre amount of income. They do not think of managing other hazards they encounter in daily life and strive to feed their families first. Below are excerpts from an interview with a primary school teacher from Agbamere community:

Female respondent (teacher at a nursery and primary School, Eha-Alumona, Nsukka):
*'I earn 30,000 Naira per month, that is 18,000 Naira minimum wage and N12,000 in allowances […] My husband is a farmer and we have 5 growing children […] A bag of rice sells for N17,000; that is my minimum wage. A cup of garri sells for N40 […] We struggle to make ends meet […] For me, the minimum wage is a hazard as it makes life difficult and exposes us to the impacts of other hazards […] It is only after you have eaten and provided food for your family that you would think of investing in flood management, especially if you can manage without getting into too much danger'***.**

Six respondents had similar complaints about the minimum wage, categorising it as a hazard which makes their households more vulnerable to other hazards such as floods or erosions. The Nigerian minimum wage is the minimum amount that is to be paid to all government workers and it is 18,000 Naira per month. A key respondent linked the low minimum wage and hazards, stating that lack of funds make families vulnerable:

Key Respondent (Zonal Coordinator, NEMA, Enugu state):
'The minimum wage can be said to be a socio-economic condition which leads to the local people becoming more vulnerable to hazards as they do not have enough money left to mitigate against other hazards […] Since hazards are also situations and things which create vulnerability, one could argue that the existence of the low wage is a hazard as well as a socio-economic condition which leads to vulnerability'.

There have been calls from Nigerians and civil societies for the Nigerian government to increase this minimum wage as it does not meet the daily needs of households. At the current amount, a family of 5 might end up living below the poverty line of $1.90 per day (Ferreira et al, 2016), when other amenities such as energy, water, accommodation and education are taken into consideration. Going through a list of minimum wages in Africa (Table 7.1), it could be seen that the Nigerian minimum wage is low in comparison to some other countries in Sub-Saharan Africa.

Table 7.1: Some minimum wages in Sub-Saharan African countries

COUNTRY	MINIMUM WAGE (USD Per Month)
Low Income African Countries	
Burundi	7
Democratic Republic of Congo	68
Tanzania	149
Lower-Middle-Income African Countries	
Zambia	98
Ghana	128
Lesotho	242
Upper-Middle-Income African Countries	
Botswana	148
South Africa	517
Algeria	531

Sources: Bhorat et al (2015)

Studies have shown that there are links between low income levels and vulnerability to disaster, as lower incomes mean that there are meagre resources available to mitigate the impacts of other hazards, such as climate change (Cutter et al, 2003; Masozera et al, 2007). This is the case of respondents in Nsukka communities where respondents present a scale of preference when it comes to tackling other hazards while surviving on a minimum wage:

> **Male respondent at Onuiyi community (primary school educated, aged 42):**
> '*When it comes to the issue of managing hazards, I cannot give up my children's food just to manage hazards […] Food for my children, their education and welfare are my priorities […] Every other thing is secondary'.*

The respondents who talked about the low minimum wage are people who work for the federal, state or local government(s). Community members who run their own businesses did not have anything to say concerning low minimum wages as hazards, since only those employed by the government get paid wages. It is important to note that employers in the private sector are not bound by law to pay the minimum wage, but are advised to do so. Most private employers and employees have personal agreements when it comes to wages. Another observation made by the researcher is that some respondents have resorted to taking up other occupations such as subsistence farming, to be able to have savings from their low incomes. Subsistence farming provides families with necessary food crops and helps in savings, as this respondent told the researcher:

Male civil servant at Agu-Echara community, Nsukka (aged 43):
'I do part-time farming […] It helps provide food for my family and helps me save a bit from my small teacher's salary, in case anything happens in the near-future'.

As is shown by this respondent, subsistence farming provides food for local families in Nsukka communities.

7.3.2: Inadequate Water Supply:

The researcher observed that except for Opi-Agu, Agu Echara, Onuiyi and Ibagwa communities, Nsukka communities do not have portable tap water supply. Almost all the respondents relied heavily on boreholes and local streams; this includes the communities that have portable tap water supply, as the water is supplied once every other week. This is what a respondent said:

Male respondent at Echara community (primary level educated, aged 55):
'We have taps which supply water […] The ones in this compound were installed around 2000 or 2001, I cannot remember the particular year […] We see water once or twice every month […] We buy water from boreholes'.

Another respondent from Opi-Agu community echoes this point made by the respondent:

Female respondent at Opi-Agu community (non-literate, aged 40):
'I have lived in this compound since I was married to my husband 16 years ago […] there are no taps here to show if portable water supply has ever existed here, although I have seen taps in some compounds in this community […] We depend on water from Isiogba Lake to use for washing, bathing and cooking'.

The shortage of potable water supply in Nsukka communities was experienced by the researcher. Throughout his time in the field, the researcher had to buy gallons of water from boreholes and carry them for some distance to where he lived. This is the norm for most Nsukka residents. Those who live next to small streams rely on such small streams to carry out household chores.

Female respondent at Agbamere community (secondary educated, aged 39):
'I usually go to a small stream behind my uncle's house in the next village to do the family washing every Saturday morning […] I do not know the source of the water […] It saves the money that would have been used to buy water from borehole'.

Drilling of boreholes and selling of water in the community is a lucrative business for members of the community who can afford it. At Opi-Agu, Owerri-Ani Onuiyi and Nru communities, a 25-litre gallon of water sells for 10 Naira. The cost of buying water for daily usage has negative economic impacts on the people in Nsukka communities. Lack of portable water supply in Nsukka communities also exposes the local people to pathogens and diseases. Rivers and lakes have been known to be polluted by sewage, industrial wastes and faecal matter, which affect the microbiological quality of these sources of water (Koshy and Nayar, 1999). Research in Rivers state (Olorode et al, 2015) and in Abia state (Eze and Chigbu, 2016) of Nigeria have shown that rivers, streams and lakes are easily contaminated in Nigeria and are reservoirs for various disease-causing pathogens in Nigeria. The findings in these researches are not limited to other states of Nigeria or to bodies of water. Research conducted by Anyanwu and Okoli (2012) on various water sources in Nsukka which included boreholes, dug wells and springs showed that these water sources are contaminated with faecal matter and *E. coli*. However, since these are the largest sources of water supply for Nsukka communities, there is a possibility that people would continually fall sick in Nsukka communities. The researcher's gatekeeper during his time in the field works part-time at a pharmacy at the University of Nigeria,

Nsukka. He told the researcher that he believed consumption of contaminated water is the reason why many students are treated for typhoid on a weekly basis.

> **Researcher's gatekeeper and neighbour during fieldwork:**
> *'We sell a lot a malaria and typhoid medicines to students […] Students do not eat healthy and there are no good water sources in Nsukka […] We all drink a lot of sachet water but we do not know where the water comes from. I think people use borehole water to make sachet water*[5]*, which is why people are always suffering from typhoid'.*

It has been estimated that out of the over 3 million people who live in Enugu state, only about 38 percent have access to portable water; over 2 million residents in Enugu communities (Nsukka included) do not have access to clean, portable water (Mamah *et al.*, 2016). Nsukka town has a Water Board Office but it has been defunct for a long time (Plate 7.1). In fact, the Water Board Office sells water to people in gallons and to the people who operate car wash businesses close to the defunct Water Board Office (Plate 7.2). The researcher tried to interview the elderly man who sells the water but he refused to grant an interview to the researcher. He told the researcher that since he is not a government official, that it is his choice not to talk to him.

Speaking to a key respondent on the issue of inadequate water supply, the researcher found out that the issue is not limited to Nsukka communities and Enugu state. The key respondent from NEMA told the researcher this:

> **Key Respondent (Zonal Coordinator, NEMA, Enugu state):**
> *'Water scarcity is a big problem for communities across the country. When I was a child, I remember water used to run inside my parents' house […] These days, it is only borehole everybody knows […] The danger with boreholes is that they can be easily contaminated. For instance, in some very rural communities I have carried out projects in Enugu, people still use pit latrines. Within such communities, people have also drilled boreholes to get water supply […] Imagine the health hazards that could occur over time in such communities due to underground water contamination'.*

As shown from the respondent's perception, boreholes are not the solution to the water problems in communities.

[5] Sachet water, also known as 'pure water' throughout Nigeria, is water packaged and sold in small plastic bags

Plate 7.1: Defunct Nsukka Water Board Office, University Road, Nsukka

Source: Author

Plate 7.2: Water sold to Nsukka residents at the Water Board Office

Source: Author

7.3.3: Hazards on Community Roads:

Transports accidents could be caused by numerous factors, ranging from human error to the presence of hazards on the roads. For the respondents in Nsukka communities, bad roads, reckless driving and overloading of vehicles have led to transport accidents. Out of the 17 communities that participated in this research, respondents from four communities listed transport accidents as hazards in their daily lives. According to a respondent from Eha-Ndiagu community, he identifies transport accidents as hazards because he travels to other states quite often to buy products for his business:

> **Male business owner at Ede Oballa, Nsukka (secondary level educated, aged 49):**
> *'I am a business man […] I travel to Onitsha and Aba very often to buy my clothing materials […] Most roads are not good and these create hazard for me as I travel weekly'.*

Most respondents in the communities told the researcher that the poor state of the roads created daily hazards, as accidents have occurred in the past, which has led to injuries. Two respondents from Agu-Echara and Umunedem communities respectively had experienced road traffic accidents due to conditions of the roads and human errors:

> **Male teacher at Agu-Echara community (university graduate, aged 51):**
> *'In 2009, I had an accident on Enugu-Nsukka road […] The vehicle I was travelling in entered a massive pothole on the road with speed and a tire got burst. The driver lost control and we ended up in a ditch […] It was a miracle we all survived but we ended up with injuries […] I fractured my arm […] I could not work for over 3 months'.*

This respondent told me that he got paid only a third of his salary during the time he was recovering from his accident. This meant that his family had to lose out on some livelihood essentials during this time. For the respondent from Umunedem community, she suffered from bruises and concussion when she was knocked off her motorbike.

> **Female farmer at Agbamere community (primary level educated, aged 47):**
> *'I was knocked off my motorbike two years ago (2013) […] I was riding to the market one morning when a speeding car knocked me down from my bike […] The car was trying to avoid a big pothole on the road and swerving at the last minute, the right side of the vehicle knocked into the left side of my motorbike […] As God would have it, I suffered a slight concussion and slight bruises […] The doctor said I was lucky […] The driver paid my hospital bills'.*

For these respondents, a combination of bad road conditions and human error led to accidents on the community roads.

The researcher observed that community roads could present hazards for the local people. In most areas, these roads are not tarred and heavy rainfall washes away the top soil on rural roads. Some of the rural roads are located next to people's farmlands. Top soil erosion, potholes and land degradation have contributed to more road hazards in local communities. A respondent at Unuiyi-Ovoko community told the researcher that the rural road has been expanding into his farmland, affecting his livelihood and putting him and members of his family at risk of being knocked down by a motorbike or vehicle (Plate 7.3):

> **Male farmer at Unuiyi Ovoko (non-literate, aged 57):**
> *'This small road was created 4 years ago (2011) because families stared selling their farmlands off […] The people who have bought these lands had to develop them so there was a need to create a small road for access […] Development is coming to this part of our community […] The problem is that the road affected some parts of my land and although I have been paid 70 thousand naira by the people who bought the lands for development, the road is now expanding and taking more of my own land'.*

Plate 7.3: Rural road created through local farming area

Source: Author

For the respondent above, he is happy that development is coming to his community. However, the cost of this development is the loss of his source of livelihood (his farmland) over time. He had been paid some form of compensation but the amount paid is not enough to purchase a new portion of land in Ovoko community. After the interview with the respondent, the researcher asked some local people how much it costs to purchase a plot of land within the community and the estimates ranged between 150,000 Naira to 250,000 Naira. There is a risk of this local farmer losing his farmland due to development. When he might be ready to get a new portion of land to farm on, inflation and land appreciation might make it almost impossible for him to buy a new portion of land, leading to loss of income and the risk of poverty.

7.4: Conclusion:

This chapter has highlighted the human-induced hazards which cause vulnerability in households in Nsukka communities. Some of these hazards are influenced by economic conditions created by poor governance structures. These hazards affect livelihoods in local households. The next chapter will present how diverse factors have increased the vulnerability of households to the impacts of these hazards.

8.0: HOUSEHOLDS VULNERABILITY TO HAZARDS IN NSUKKA COMMUNITIES

8.1: Introduction:

This chapter deals with the needs of Nsukka households and resources required to build resilience and reduce vulnerability to hazards in the local communities. According to the Sustainable Livelihood Model, five assets (or capacities) are essential for poverty and vulnerability reduction in communities. Physical, natural, financial, social and human assets help communities adapt to the impact of hazards and provide such communities with the necessary requirements for efficient hazards mitigation and sustainability (Krantz, 2001). The chapter highlights the assets available to Nsukka communities and then shows how deficiency or reduction in the assets creates vulnerable conditions for the members of Nsukka communities.

8.2: Household Needs:

The researcher asked the respondents in the semi-structured interviews what they consider the essential needs of their household. This open-ended question was aimed at understanding what the respondents feel they require in their daily lives that would reduce their vulnerability to hazards in the communities they live in. Respondents did not rank their needs from the most important down to the least important. However, the findings from the research suggest that some needs are prioritised in all Nsukka communities as they were mentioned more often by the respondents (Table 8.1). There were also some differences in needs depending on the location and type of hazards affecting each community. In a community like Opi-Agu, which is usually affected by floods, the need for adequate drainage was mentioned by more respondents than the need for amenities such as water supply.

Table 8.1: Household Needs of Respondents in Nsukka communities

Household Needs (General category)	Household Needs (Sub-categories)	Frequency
INCOME	- Cash Incentives	42
	- Reliable income sources	21
	- Access to loans	22
	- Better employment opportunities	14
AGRICULTURE	- Arable farmlands	33
	- Compensation for lost farmlands	12
AMENITIES	- Better drainage to prevent floods	19
	- Good and assessable roads	20
	- Portable water supply	22
EDUCATION	- Local knowledge to help future generations in adaptation	27
	- Better information shared by government to local communities	18

Source: Author

For Nsukka households, cash incentives from the government were mostly required (frequency of 16.8%). The respondents argued that they should be given this incentive as prices of commodities keep going up on a daily basis while income levels go down. Another line of argument is that since the oil comes from the Southern region of the country, generates huge revenues and belongs to all Nigerians, the government should share the revenue to those who need it, rather than allowing corrupt officials loot the economy as is the norm.

> **Key Respondent (Former Permanent Secretary in Enugu State Government):**
> *'I believe we have reached the point where incentives from crude oil should be shared to families […] There is hunger in the land […] It is done in Saudi Arabia and every family is comfortable there […] It pains me that every day on the news, it is one politician or another stole so and so billions, while people are dying of hunger'.*

A third suggestion from the respondents was that government should pay the poorest families in rural communities some bulk money to enable them start up livelihoods. This is an interesting perception which seems to have been recently adopted by the Federal government as well because last year, plans

were put in place to begin paying the poorest in all Nigerian communities 5,000 Naira monthly stipend for sustenance. The present government is trying to fulfil the promise as it was made during the election campaign. This initiative, called the Social Security Program and part of the government's Social Investment Programmes has led to the distribution of funds to the poorest in nine states of the country in January 2017. To determine who the beneficiaries should be, the government is using the community-based targeting (CBT) idea of the World Bank (Nwabugiogu, 2017). However, there is a corruption scandal trailing the initiative already, as reports suggest that politicians are trying to hijack the initiative and embezzle the funds meant for the poor. It has been reported that in some of the pilot states, top politicians are choosing those who should or should not benefit from the program, leaving the vulnerable in communities even more vulnerable. Reports of fake social registers and lists trail the program already, despite the program being initiated in just nine states out of 36 (Ogudele *et al*., 2017). It is important to note that none of the Southeast states was part of this pilot program, as states in the pilot were Kwara, Cross Rivers, Niger, Bauchi, Ekiti, Ogun, Oyo, Borno and Kogi states respectively (Nwabugiogu, 2017). The second most important household requirement in Nsukka communities, as identified in the research, was arable farmlands (frequency of 13.2%). This was especially important to large families as respondents highlighted the need to practice subsistence agriculture to reduce the amount of money spent on the rising costs of farm produce. As a respondent from Edem community puts it:

> **Female teacher at Edem community (college educated, aged 39):**
> *'The prices of foodstuffs keep rising every month […] It is important to have land where one can grow regular crops like cassava, yams and vegetables to feed the family, no matter how small the land is'.*

For this respondent, it is essential for local families to own lands as such lands provide food sources for families. Unfortunately, there are no known initiatives in Nsukka communities which are aimed at giving arable farmlands to families who are in need of land. Farmlands are inherited by men from their fathers or from their kinsmen. In families where a woman heads the house without a male figure, getting arable lands becomes almost impossible. Less money spend on food items from the market will lead to more savings being made by households, which may help these households invest more in hazards mitigation. The importance of passing down local knowledge comes next (frequency of 10.8%). According to a key respondent, local knowledge is very important for the younger generation:

> **Key Respondent (Nze from Opi-Agu community):**
> *'One's roots are very important, as one must always come home in the end, either as an integrated community member or as a corpse […] The young ones all want to go off to big cities and overseas, they forget that it is our local knowledge that has kept us all alive for generations […]* ***A na-esi n'uno mara mma puo ezi'.***

The idiom at the end of the respondent's response means: One starts to look beautiful from within the house before sharing that beauty to the outside world. What the respondent said in this context is the knowledge of one's home is the starting point in striving to obtain knowledge of the outside world. Most respondents share similar views on the need to share local knowledge to younger generations to sustain the knowledge, especially in the Nigerian context where government is slow in responding to immediate needs of the people in local communities. Potable water supply and access to loans for households both come next on the needs of households in Nsukka communities (both at the same frequency of 8.8%). Respondents felt that potable water supply would reduce the outbreak of waterborne diseases and the stress of lifting heavy containers of water from streams, rivers or boreholes, especially for children. The research confirms that this is important as he experienced how much stress lifting 25-litre gallons from borehole sites to his temporary residence in one of the communities put on him. Water used in households is usually fetched by the children households

early in the morning. By the time they fill up containers at home and prepare for school, they are already tired. This could contribute to poor results from schools in local communities. Households said they required loans to pay off debts, school fees of their children and invest more in their businesses to get more profit. More profits would mean more savings. For farming families in Nsukka communities, loans would help them buy fertilizers (which are very expensive) and maximize yields. Increased yields could help cushion the impacts of natural hazards by creating availability of excess stock in case of disasters in local communities. Reliable income sources, good and assessable roads and better drainage for flood management are the next needs. The importance of better information on hazards and disasters from the government to the local people was identified as one of the needs of households (7.2%). It has been shown in the flood hazards section of this research that lack of information to local people exacerbates the possibility of disasters. Information sharing to the local people is important as local knowledge alone is not sufficient in tackling disasters; there is a need for a synergy of local and scientific knowledge for reducing vulnerability especially at community level (Mercer et al, 2010). Better employment opportunities and compensation for lost farmlands are the last needs identified by households at 5.6% and 4.8% respectively.

8.3: Conclusion:

The purpose of this chapter has been to show the capacities available to households in Nsukka communities. Different assets which help the local people adapt and mitigate stresses in their communities exist. However, factors such as the inefficiency of government resources and the perceptions on culture and local laws create increased vulnerability for household. The next chapter will present the strategies and initiatives that the government (federal, state and local levels) have implemented to help manage hazards and disasters in Nsukka communities. The challenges faced by government agencies concerned with disaster risk reduction will also be presented.

9.0: HAZARDS MITIGATION, DISASTER RISK REDUCTION AND THE NIGERIAN GOVERNMENT

9.1: Introduction:

This chapter presents findings on how stakeholder agencies in Enugu state and Nigeria in general deals with mitigating hazards to reduce vulnerability to disaster risks at the community level, regarding Nsukka communities. Respondents from concerned agencies were interviewed for this research. In most cases, it was difficult to get access to top officials at these agencies due to bureaucracy and lack of interest. However, after much pressure and persistence, the researcher gathered some key responses to key government official which show the disaster management landscape in Nsukka and Enugu state, from the perception of concerned agencies and the government.

9.2: National Framework and Concerned Agencies:

The history of government's involvement in disaster management in Nigeria dates to 1906, following the establishment of Nigerian Fire Brigade as an agency not only concerned with fighting fires, but also responding to other types of emergencies. The first emergency agency, National Emergency Relief Agency (NERA), was set up in response to heavy flooding across the country in 1976. In response to the United Nations International Decade for Natural Disaster Reduction (IDNDR), the federal government in 1993 expanded the NERA into an inter-government ministries agency for managing disasters at all level. This led to the agency becoming an independent agency under the office of the presidency. Following a workshop by NERA with concerned stakeholders 1997, the agency was expanded into the National Emergency Management Agency (NEMA) and is backed by Act 12 of the 1999 Constitution of the Federal Republic of Nigeria (Prevention Web, 2010; NEMA, 2013). The first framework developed in 2001 was called the National Disaster Response Plan (NDRP) of 2001 but it is now the National Disaster Management Framework (NDMF). The framework acts as a guide to disaster management in the country, following the recommendations of UNISDR (NEMA, 2013; Fagbemi, 2011).

Under the national framework, different agencies are responsible for disaster risk reduction throughout Nigeria, from the community level all the way to the global level. At the local communities' level, LEMA (local emergency management agency) is responsible for disaster risk reduction (DRR) at local government areas. Headed by the vice-chairperson of every local government area, the agency is required to work with traditional rulers, local government departments, military and paramilitary organisations, and other government and non-governmental agencies to coordinate and carry out effective disaster risk reduction in communities in local governments. LEMA reports back to the State Emergency Management Agency (SEMA). At the state level, SEMA is responsible for DRR throughout every state. The deputy governor of every state is the chairperson of SEMA and the agency works together with state ministries, military and paramilitary organisations, and other government and non-governmental agencies in the coordination of DRR initiatives at the state level. The agency reports to NEMA, which is the national platform responsible for effective DRR throughout the country. NEMA works with closely with LEMA and SEMA through zonal offices located at all the 6 geopolitical zones in the country (NEMA, 2013; NEMA, 2014). For this research, the researcher had in-depth interviews with 5 key respondents of different sectors of the community and government (Table 9.1). These respondents could intimate the researcher on the government's initiatives (and failures) in hazards management and disaster risk reduction in Nsukka and Enugu communities.

Table 9.1: Key respondents in the research

LOCATION	POSITION IN AGENCY/COMMUNITY
NEMA South-East Zonal Office, Enugu state	Zonal Planning Officer, NEMA South-East Zone
Nike, Enugu state	Traditional Ruler of Nike Kingdom, Enugu state
Opi community, Nsukka	'Nze', Igwe Council member and Kingmaker at Opi-Agu, Nsukka
Nsukka	Police Inspector in Nsukka town
Enugu	Former Permanent Secretary, Enugu state government

Source: Author

9.3: Disaster Management in Nsukka communities and environs:

During his time in the field, the researcher went to the NEMA Zonal Office in Enugu town to interview key stakeholders on the efforts of the agency toward DRR in Enugu and with special reference to Nsukka. While the Zonal Director refused to grant the researcher an interview (his reason being that the researcher did not have a referee nor a recommendation), the Zonal Planning Officer agreed to grant an interview with the researcher. The interview with the Zonal Planning Officer went well. He told the researcher about the strategies implemented by the national, state and local governments together with NEMA and other stakeholder agencies to ensure efficient DRR in communities across Nigeria. He then narrowed it down to specific initiatives in Nsukka communities:

> **Key Respondent (Zonal Planning Officer, NEMA, Enugu state):**
> *'The activities of NEMA in Enugu state and Nsukka communities which help reduce the vulnerability of the local people to hazards and create awareness are categorised into the emergency management vanguards (EMVs) Project, DRR Clubs, disaster management workshops, advocacy visits, rescue operations and community assessments […] These are to be carried out in partnership with other agencies like the Police, the Federal Road Safety Commission (FRSC) and Red Cross'.*

This response from the respondent suggests that there are various initiatives aimed at DRR for local communities in Enugu state.

9.3.1: The Emergency Management Vanguards (EMVs) Program:

According to Mr Olakunle, the EMVs Project was established in 2008 but became fully functional in 2014. The aim of the project is to train Nigerian Youth Corps members in different orientation camps across the country on disaster management. The aim is to utilize NYSC (National Youth Service Corps) members as proactive emergency management experts in local communities across the country. He believes the program has been a success and has been resourceful in Nsukka communities.

> **Key Respondent (Zonal Planning Officer, NEMA, Enugu state):**
> *'The EMVs project in Enugu state has led to the establishment of Disaster Management CDS (Community Development Service) in different local government areas of Enugu state […] Nsukka has a Disaster Management CDS which has helped local people affected by hazards such as community floods […] They report to the local government and I have heard news of them helping in relocating families affected by hazards […] The EMVs project has proven to be the one of the best ways to take disaster management from the Federal level, through the state level directly to the community level […] Youth Corps members are usually posted to rural areas and are the most assessable representation of the government and country that local people see'.*

After graduation from the university, Nigerian students are required to undertake a one-year NYSC program. The program is aimed at embedding discipline in the mind of the Nigerian youth, introducing youths to the cultural diversity which keeps the country united, to train the youths in preparation for national mobilisation, to create unity through ethnic bonds among other things (NYSC, 2017). Graduates are usually posted to local communities different from their communities of origin to experience diverse cultures. At all levels, youth corps members are accepted as the children of every community they are posted to and form a vital part of the communities where they undertake their postings. In Opi-Agu and Echara communities of Nsukka, the researcher confirmed the existence of the Disaster Management CDS affiliated to EMVs. The day the researcher went to Nsukka LGA headquarters, he came across a youth corps member who was a representative from Echara Disaster Management CDS; he had come to see the local government chairman. The researcher had an informal interview with him and he told the researcher about the activities of his CDS:

> **Disaster Management CDS Corps Coordinator, Echara, Nsukka:**
> *'We go out on community outreach programs […] we speak to the local people on the hazards which affect community life in rural areas. We teach them how to aware in case floods happen […] The local people have knowledge on the changing weather patterns in their community, when heavy rain is about to come down […] The problem is how to protect themselves and families from the impact of floods […] The local government chairman sponsored pamphlets on disaster awareness we distributed to people at Echara last year […] The problem is that a high number rural people cannot read and write, so I do not know if they really understand the pamphlets […] Another problem was language barriers between youth corps members from other ethnic groups in the country and the local people […] These days, we mostly do relief work in the communities which help in vulnerability reduction […] An example is during last week's CDS meeting, we went out to help some widows plant crops for their subsistence farmlands, to ensure they have food during harvest time'.*

This respondent became the researcher's gatekeeper for the close-ended questionnaires used in this research. The researcher explained to him that he would like youth corps members in the Disaster Management CDS to be the closed-ended respondents in this research. He was very pleased, as he believed this would be a great platform for the youth corps members to add their valuable knowledge

to a credible research. For his Echara branch, there were 36 youth corps members in the CDS. He collected 26 closed-ended questionnaires from the researcher and they exchanged numbers. The next day, he met with the researcher; he came to see the researcher accompanied by the youth corps coordinator for Opi-Agu community Disaster Management CDS. She collected 27 close-ended questionnaires to be distributed among the members of her CDS group. Questionnaires for Obollo Afor Disaster Management CDS were given to both CDS coordinators who gave them onto the group. In all, the researcher distributed 81 questionnaires, out of which 72 completed questionnaires were returned to the researcher. After the researcher received the completed questionnaires, he analysed them while in the field. Out of the 72 completed respondents, 40 were female and 32 were male (Table 9.2).

Table 9.2: Number of EMVs and regions of origin

Region	**Gender**	
	Male	**Female**
South-East	10	12
South-South	5	6
South-West	9	11
North-East	2	2
North-West	2	4
North-Central	4	5
Total	**32**	**40**

Source: Author

From the analysis of the questionnaires, the EMVs from the South-East (Igbo-speaking) region of the country were 22 youth corps members, which represents 30.5% (male=10, female=12) of the corps members. These EMVs do not have problems communicating with the local people at the communities of their primary assignments. Out of the EMVs from the other regions of the country, 22.2% (n=16) do not speak the Igbo language but understand some aspects of the language and could communicate with the members of their local communities of primary assignment, to some extent. The rest of the EMVs do not speak nor understand the Igbo language and this makes communicating with the local people of issues of hazards and disaster risk reduction can be a challenge. Fifty of the EMVs (69.4%) responded in the affirmative that awareness programs exist in their local communities; however, only 44.4% (n=32) believe the government and NEMA does enough to mitigate hazards in their local communities of primary assignment. The questionnaires show that government and NEMA should invest more in disaster management training for EMVs in Nsukka communities, as only 11 of the EMVs (equivalent to 15.2% of the 72 respondents) have had any formal training on disaster management in local communities, organised by NEMA and the government. According to the Disaster Management CDS Corps Coordinator at Echara (Emeka Ofili), NEMA gives talks to new EMVs on their induction into the CDS, but most times, that is as far as it goes. They send materials to the CDS from time to time, which are used to go on awareness and sensitization drives in local communities (Plate 9.1 and Plate 9.2).

Plate 9.1: EMVs on a sensitization program at a market in Aba, Abia state

Source: NEMA (2015)

Plate 9.2: EMVs on flood awareness program at a community in South-West Nigeria

Source: NEMA (2016)

During his time in the field and after the interview with the NEMA official, the researcher visited three secondary schools to ask if there were DRR Clubs in their schools. In all schools, there was no evidence of DRR Clubs as initially insinuated by the NEMA Zonal Planning Officer.

- *'DRR Club? I have never heard of that before. We have Press Club, Jet Club and Debate Club in this school, but I have never heard of DRR Club'* – **Principal, Holy Redeemer College, Nru, Nsukka.**

- *'If such a club exists, I have never heard of it before. However, it does not exist in my school'* – **Principal, Community Secondary School, Obollo.**

- *'We have Press Club, Jet Club and French Club in my school. We do not have DRR Club'* – **Vice principal, Government Technical College, Nguru, Nsukka.**

9.3.2: Disaster Workshops, Education and the Political Landscape:

The principal at Holy Redeemer College, Nru, told the researcher that in the past, an event had been organised where FRSC and NEMA officials from Enugu state offices came and spoke to students:

> **Principal, Holy Redeemer College, Nru, Nsukka:**
> *'Sometime two years ago, we had a workshop sort of event in these church premises to create awareness in the school and community on the impacts of floods. The event was sponsored by the archdiocese […] Many households were affected by the floods and the church provided relief to some households […] The officials spoke to the students and church members after mass on how to protect themselves from the impacts of floods in the community'*.

Disaster management workshops are essential for disaster risk reduction in communities. These workshops provide a platform for assessing the hazards in local communities, interacting with members of communities and acknowledging the needs of local people. Disaster workshops are essential tools for disaster education as hazards knowledge and disaster experiences are shared (Ashrose and Praveen, 2015). Disaster workshops and awareness programs have been carried out by the government in some communities in Nsukka in the past. According to a key respondent, the local government chairman and traditional rulers hosted an event in January 2013 where community leaders were given the chance to talk about measures that are essential to prevent flooding in their various communities, as the floods of 2012 affected many households:

> **Key respondent (Nze at Opi-Agu, Nsukka):**
> *'I was part of the delegation from my community to the workshop held at the Nsukka local government headquarters […] There were representatives from NEMA and Civil Defence at the workshop […] We presented the challenges faced by households in our communities […] After teaching us how to build barriers to prevent floods for getting into our households among other things, we were promised allocations by the local government chairman to help in flood management […] Apart from the good food and drinks from that workshop, we did not get an allocation or monetary help in the end, till today. I do not know if other communities got anything'*.

The issue of government making promises to the people in local communities and not fulfilling those promises has led to increased vulnerability to hazards in local communities. This point was echoed by the traditional ruler of Nike town in Enugu state, whom the researcher interviewed while in the field.

Key Respondent (Traditional Ruler of Nike Kingdom, Enugu state):

'The problem is that government make a lot of promises to the local people just to get votes […] In the end, it is empty talk. The danger in this is local people abandon the ways they have used for adaptation and mitigation against community hazards in the past, while waiting for the government to help them […] This is double tragedy as people who have these problems become even more vulnerable […] By the time they realise the government might never come to aid, it is already too late'.

The political landscape exposes Nigerian communities to hazards and disasters. During campaign for elections, the candidates promise to provide all the needs of the local people as soon as they get into office. They entice people to vote for them by sharing foodstuffs, clothing materials and money to the community members. The researcher saw this happen when he was in the field as that was during election period in Nigeria. There was a community rally organised by the prospective senator to represent Nsukka zone at the National Assembly close to where the researcher resided around Odenigbo Roundabout in Nsukka. During the rally, the researcher saw local people from different Nsukka communities come out to support the prospective senator and community representatives were given opportunities to talk about the hazards and difficulties faced in their communities. The prospective senator promised to change the plight of the people by taking their problems to the national level and fighting till all their needs are met, as soon as he is voted into office. Towards the end of the rally, cups of rice, tinned tomatoes, t-shirts and wrappers were shared to the local people. The prospective senator is now a senator of the Federal republic of Nigeria. This is not an isolated incident as this is the norm across all states in Nigeria. In fact, the local people look forward to what they can gain immediately from political office campaigners, as they are not sure if promises would be kept. A woman who lived in the same compound with the respondent and who collected the gifts from the rally told the researcher: *'Let us enjoy this one now because if he wins, we will never see him again'*. This perception was echoed by a key respondent. He told the researcher that members of communities will always see politicians as liars, but will vote them in because of lack of options and the understanding that someone must be voted in.

Key Respondent (Traditional Ruler of Nike Kingdom, Enugu state):

'The sad reality is that the local people know that these politicians will do anything to buy their votes […] During campaigns, they go on advocacy visits into the rural communities, to see the problems faced by the local people […] As a traditional ruler, I have had my fair share of politicians coming to my palace trying to buy favour […] I turn them away once they begin to seek my support […] Some of them even go as far as starting up projects which would make them look good in the eyes of the community members and reduce vulnerability to hazards briefly […] In the end, once they have been voted in, you do not see them anymore […] Before the elections, they would come and break kolanuts with me every morning. After the election, you never see them anymore'.

In many ways, NEMA has filled in some gaps created by some insensitive and corrupt government officials, who abandon their local communities once they have been voted into office. Different projects have been carried out in Enugu state by NEMA. In Nsukka communities, the agency has undertaken relief initiatives in the past for families that have been affected by hazards. According to Nze Titus Ibekwe, he remembers that the agency brought foodstuffs and condiments to his community during the floods of 2012.

Key Respondent (Nze from Opi-Agu, Nsukka):

'Some representatives of NEMA brought foodstuffs which they shared to women in my community […] It was not much but it made a difference to families who had lost their crops to the floods and fed hungry children for a while'.

Disaster relief in communities could also range from gifts of food stuffs and toiletries, to assisting in the building of flood protection barriers and relocation. The agency works together with the state government in providing relief for local communities in Enugu state. According to Mr Olakunle Johnson, the agency does more than provide temporary relief to communities. He told the researcher that the agency built temporary shelters in the fields of some communities that were severely affected by the floods, where cooked food and clothing items were distributed. However, no respondent in the research could confirm or refute this story, as nobody remembers such project being carried out by NEMA in their communities after the impact of the floods. However, another key respondent agrees that Enugu state government together with different agencies, such as NEMA, has helped in the mitigation of hazards in local communities and reduced vulnerability to some extent:

Key Respondent (Former Permanent Secretary, Enugu State Government):

'My community is Enugwu-Ezike in Igboeze North LGA, but we identify under Nsukka. Any government initiatives carried out in my local community is also carried out in Nsukka […] I know that government and NEMA have helped people who experience hazards in Nsukka and my community as well […] The initiative I am sure about from my time in government is that the local government in Igboeze and Nsukka loan road repairing machinery and trucks to local communities, once the communities can be able to fuel the machinery […] I heard the initiative is still going on till date'.

Such an initiative may help local people in Nsukka manage hazards which affect the community in general. However, the problem lies with how funds for fuelling the machinery would be gathered from the local people. Most local people do not have enough to feed their families and manage hazards in their households; trying to convince them to contribute the money they do not have towards buying fuel to repair roads might be tricky.

9.4: NEMA and Disaster Management in Nsukka and environs – Challenges:

The role of government and NEMA has been limited in disaster risk and vulnerability reduction in Nsukka communities. For NEMA, the agency faces different challenges which contribute to increasing the vulnerability of households to hazards and disasters. These challenges limit the agencies abilities to efficiently carry out its responsibilities in Nsukka and other communities in Enugu state.

9.4.1: Misunderstood Roles of Stakeholders:

According to the Nigerian National Disaster Framework, which acts as a guide to hazards and disaster management in the country, different stakeholders from all sectors need to know their roles and responsibilities for efficient disaster management to take place in communities. For this to be effective there needs to be collaboration, coordination and communication between all stakeholders associated with disaster risk reduction and management (Prevention Web, 2010). This is in line with both the Hyogo Framework for Action and Sendai Framework recommendations. However, the researcher found out that there is a lack of communication and understanding between concerned stakeholders. In an emergency situation, the different stakeholders do not understand what roles they are to play. This point was echoed by the NEMA official:

> **Key Respondent (Zonal Planning Officer, NEMA, Enugu state):**
> *'There is a misunderstanding of what roles should be played by which agency or stakeholder during an emergency in communities […] This has led to over-expectations and little progress in emergency situations For example, when NEMA visited the Nsukka communities where Fulani herdsmen killed people, issues like which organization should take the lead and be at the forefront caused all the organizations represented to do their own things […] There was no interaction or sharing of information, which is wrong [...] The police do not want NEMA to tell them their job description, the FRSC does not want police to tell them what their job description should be, NEMA does not want the Army to act in a different way […] This power show in emergency situations has led to inefficient disaster management at local level'.*

When the researcher had an interview with a member of the Nigerian Police Force in Nsukka, he had other ideas of what the role of the Police should be in emergencies in the community.

> **Key Respondent (Police Inspector in Nsukka town):**
> *'It is the responsibility of the Nigerian Police Force to serve and to protect the country's citizens from any hazardous and dangerous situation […] If an accident occurs on the road, it is the police who arrive first and take charge of the situation, as we are the ones who monitor our roads […] Onlookers and people passing-by overwhelm disaster or emergency sites, making it difficult for the concerned agencies to do their job, but we are the once who keep law and order […] Other agencies should listen to us but everybody comes to an emergency site and try to do their own thing, causing confusion and creating a disorganized emergency site'.*

Such conflicting interpretations of roles for concerned stakeholders in disaster management could lead to increased vulnerability of the local people. In emergency situation, someone has to take charge to ensure the safety of others and reduce the likelihood of more people being affected by the situation.

> **Key respondent (Zonal Planning Officer, NEMA, Enugu state):**
> *'During interactive sessions between the heads of these different agencies that are involved in disaster management, explanation over this issue has been given to such concerned agencies […] Our bosses tell us that every organization knows what they should do but when you go*

out there in an emergency, it is still the same case […] The situation has not changed and keeps repeating itself over again whenever a disaster occurs'.

The researcher discovered that the reason these stakeholders have such conflicting notions on how disaster management should work is that apart from NEMA, no other agencies that should be involved in disaster management know about the National Disaster Management Framework nor the Hyogo Framework for Action. During his time in the field, the researcher had the opportunity of talking to his parents' friends who work in different government agencies and parastatals in Nigeria and none of them had ever heard of a framework used in managing disasters in Nigeria. Different agencies across the country have their own frameworks or guidelines which dictate how these agencies carry out their activities in different capacities. For NEMA, the National Disaster Management Framework acts as the guideline for the agency's activities, which are centered on disaster management. For instance, the Nigerian Police Force has its Mission Statement and Policies which acts as the guideline for its activities (Nigerian Police Force, 2017). What is lacking is a synergy of the policies of these different stakeholders to create a single policy on disaster management, which would be adopted by all the stakeholders.

9.4.2: Incapacities at State and Local Government levels:

A second challenge faced by stakeholder agencies such as NEMA in implementing efficient disaster risk reduction in local communities is lack of resources from the state and local governments. State and local governments are reluctant to invest in proactive DRR strategies, preferring to invest in response to the impacts of hazards and disasters. This has increased vulnerability for Nsukka communities, as one of the key respondents says:

Key Respondent (Former Permanent Secretary, Enugu State Government):
'If government had checked that Eha erosion when they should have done it decades ago, it would not have led to the suffering the people have experienced over the years […] It is the same problem with my community (Enugu-Ezike) […] Failure of government to build drainages in my village has led to people I know losing ancestral farmlands to landslides and erosion'.

From the perspective of the NEMA official, the state and local governments do not invest enough in disaster prevention and mitigation strategies. There are no budgetary allocations towards tackling hazards in local communities. The idea of ignoring communities until hazards lead to disaster then providing relief to those affected, is having adverse effects on disaster management across the country. According to him:

Key Respondent (Zonal Planning Officer, NEMA, Enugu state):
'Apart from the employees of NEMA, EMVs and volunteers, there are no other people seriously involved in disaster risk reduction in the state […] Communities are always vulnerable to the impacts of hazards and are mostly saved by their knowledge of their environment […] As an agency that works to protect people in communities in Enugu state, the government should map out funds to help us with our work […] They will say our agency is of the federal government but forget we work with limited funds coming from the top […] I have friends in Abuja that have gone for overseas training twice in just this year. The last training I went for was a short conference in Lagos last month sponsored by the federal government'.

In searching through literature and documents online, the researcher came across the Enugu state budgets for 2013 and 2016 fiscal year. The budget for the 2013 fiscal year for Enugu state was almost 83 billion naira. Unfortunately, the researcher was unable to see the specific allocation of funds to the different projects, agencies and government parastatals, as the document available online on showed the table of contents and interpretation of the speech given by the acting governor to the House of Assembly. It is interesting to note that there were provisions made for funds to be allocated to the Ministry of Environment and Mineral resources (pg. 167), the Ministry of Human development and Poverty Reduction (pg. 177) and the State Emergency Management Agency, which is the state arm of NEMA (pg. 221) (Enugu State of Nigeria, 2013). In the 2016 budget, over 644 million naira was mapped out for the Nigerian Erosion Watershed Management Project (NEWMAP), Ministry of Human Development and Poverty Reduction was allocated 379 million naira while the State Emergency Management Agency was given over 64 million naira for the fiscal year (Enugu State of Nigeria, 2016). This confirms that funds have been set aside for emergency management, poverty and vulnerability reduction and disaster risk reduction by the state government during budget implementation. The question remains: why are the local people to vulnerable to hazards like erosions and floods? Why was it that the zonal planning officer of NEMA South-East at the time the researcher was in the field was unable to confirm the allocation of funds to the SEMA? A key respondent had this to say about allocation of funds in government agencies:

> **Key Respondent (Police Inspector in Nsukka town):**
> *'Corruption is affecting all areas of government, from federal to local level […] I can tell you that even in the police force, the level of corruption and embezzlement is shocking […] Just start from the officer on the roads who put illegal checkpoints to extort motorists […] We know these things but what can one do? You talk too much, you lose your job […] This is the problem with government agencies in this country. You know what your boss is doing but will you talk?'*

This key respondent suggests that corruption and embezzlement of funds by officials in government agencies are the reasons why funds might not be accounted for. Priority 2 of the Sendai Framework for DRR highlights the need for an integrated, competent and coordinated approach to disaster risk reduction. Such an approach should involve the participation of all relevant stakeholders and improved disaster risk transparency across all sectors (UNISDR, 2015; pg. 17). The different government ministries above should be working with SEMA and NEMA: poverty reduction leads to vulnerability reduction, which leads to disaster risk reduction; the first step in managing vulnerability to natural hazards involves the management of the environment. Therefore, allocated funds which are not properly accounted for and the inability of stakeholders to work together increases vulnerability at local communities, including in Nsukka. Funding issues have led to NEMA to implement vulnerability and capacity analysis (VCA) for only 21 local government areas of Nigeria, out of the 774 local government areas in the country. Insufficient funding of disaster management initiatives has also prevented the translation of disaster management publications for communities into local languages. Such publications would educate the local people on their roles and responsibilities in disaster risk reduction in their daily lives (Fagbemi, 2011, Sadiq, 2012). While this is essential for community development and awareness, the fact is that local people who do not speak English language might also find it difficult to read their local languages. In Nigeria, local language is spoken in households and not written down; children grow up speaking their mother tongue but not being able to read it or write it down. Another problem identified is that the State Emergency Management Agencies (SEMA) and Local Emergency Management Agencies (LEMA) do not work together in Enugu state. All disaster management initiatives in local communities still come directly from the top. When the researcher was in the field, he could not confirm the existence of LEMA in Nsukka Local Government Area. In a brief conversation he had at the local government office, no one had heard of LEMA. While provisions are made in the National Disaster Management Framework for the existence

of LEMA, to act as the link between the local communities and the state government, the agency does not exist in Nsukka. In its place, the EMV Project exists. However, this project is only as relevant as the efforts put into training the youth corps members on a yearly basis.

9.4.3: Communication Problems:

Nigeria is a multicultural and diverse nation made up of different ethnic groups. In government agencies, individuals from different states of origin are employed. The spirit of 'One Nigeria' means that people working in government agencies get transferred to different regions of the country. While this may not constitute any problem at cities and urban centres, as the official language of Nigeria is English, government workers have found it hard to communicate to members of rural communities that speak different local languages. This is one of the challenges faced by stakeholders involved in disaster risk reduction in Nsukka and other communities in Enugu state:

> **Key Respondent (Zonal Planning Officer, NEMA South-East):**
> *'I am a Yoruba man […] I do not speak Igbo language […] Sometimes it is difficult when we go out into the field for a project in a rural community […] Most people in these communities do not speak English language, as they are not educated […] This becomes a problem in disaster management […] Some of these people are disaster champions in their own right as they have credible knowledge of their environment and community processes […] Not knowing how to speak Igbo is a challenge'.*

This point is echoed by another key respondent:

> **Key Respondent (Police Inspector in Nsukka town).**
> *'When I was posted to Nsukka, I thought language would not be a problem […] I am an Ijaw man but I have lived in parts of Delta state where Igbo is spoken and I understood it a bit […] Coming to Nsukka, I found out that I could not understand the dialect at all, even though it is Igbo'.*

While the researcher did not experience this problem while he was in the field, he had to pay extra attention to some respondents who spoke in their deep dialect, which is a bit different from normal Igbo language. Another area where communication is important in government's role in local communities is in the culture of the local people. It is important that government agencies know the culture of the people in areas where they work. However, this can be a challenge as government workers who come from other regions of the country may not know the significance of some actions in the local communities. One of the key respondents explained this to the researcher when he was asked about the influence of local culture.

> **Key Respondent (Nze from, Opi-Agu, Nsukka):**
> *'The people the government should help are the rural people, people who are most affected by hazards in the community […] When you speak someone's local language, that person trusts you […] The problem is that when there is a project in the community, the people carrying out the project do not speak to community members […] they do not understand the language and the local people do not understand them'.*

The language barrier might not be too much of an issue for organisations such as NEMA, as they could easily afford translators. However, the problem lies in what the local people are willing to tell the translator. A translator from a community where a project is being carried out might twist what respondents tell him or her to the advantage or disadvantage of concerned parties. On the other hand,

a translator who comes in the company of stakeholders to the community for a project may not be able to get all the necessary information out of the local people, as they might not entirely trust such translator. It is not possible to subject people who work for agencies such as NEMA, to working in their own states or communities, as this is against the ideology of federalism and 'one Nigeria'. What is needed is a system which works for both the stakeholders (government and agencies) and members of local communities such as Nsukka.

9.5: Conclusion:

The chapter has presented the perceptions and initiatives of the government towards disaster risk reduction in Nsukka communities and other Enugu communities, as seen through the lenses of key stakeholders. The importance of the EMV Project across Nigerian communities has been presented as the best initiative by the government, through NEMA is using to get to the rural communities. However, inefficient funding and lack of stakeholders' synergy still lead to inadequate disaster risk reduction in local communities. Corruption, politics and power play continue to create an air of uncertainty in disaster risk reduction for local communities in Nsukka and environs. The political climate in Nigeria creates a sense of mistrust for the government at the local level and this will continue to create problems for future disaster management plans for local communities. The next chapter will present the conclusions of this research, while trying to make recommendations on how best to foster disaster risk reduction from the local level up to the national and international level.

10.0: SUMMARY OF RESEARCH FINDINGS:

10.1: Introduction:

The previous chapter presented the findings in the field for this research. The perceptions of the local people towards hazards and impacts were presented. Initiatives by households and various stakeholders as well as challenges in carrying out effective DRR at the local communities were highlighted. This chapter analyses the impacts of hazards from the findings and shows how assets (or lack of assets) have influenced DRR in Nsukka communities. The chapter is divided into two sections. The first deals with the summary of hazards and their impacts, as well as how conditions in the community influence these hazards. The second section highlights assets available to people in Nsukka communities and vulnerabilities created by the inefficiency of these assets in Nsukka communities.

10.2: Summary of Hazards and Impacts:

Flood hazards have led to loss of livelihood for local people in Nsukka and affected incomes. The negative impact of floods on the income levels of people in communities was observed in the aftermath of the 2012 floods across Nigeria. The floods severely affected incomes from commercial agriculture in Nigeria as over 7 billion naira was lost in crop production incomes while a further 2.6 billion naira was lost in the fisheries sector incomes across states most affected by the floods (GFDRR, 2013). While large scale farmers suffered income losses which changed their lives, they were still able to divert into other avenues for generating income. For some local people, loss of income and livelihoods due to the impact of floods have left them without any hope of recovery as they have no idea on how to generate income from other sources. The impacts of floods could also lead to other problems in people's lives, as noticed in the case of a respondent from Ibagwa-Ani community who developed a health condition. Throughout this research, the researcher observed that local farmers were the ones who suffered most from the impacts of floods and erosion in local communities. A significant percentage of these farmers who could not recover from impacts of floods and erosion were uneducated. Most of them have been farmers all their lives and farming is all they have ever known, learning from their parents and grandparents from a very young age. They do not know how to make the transition from farming into other business and do not have the resources to do so. Gaining useful employment is a big challenge for these local farmers who have lost their livelihoods. Findings also suggest that some respondents who run businesses other than farming and for some who work in the private and government sectors, the floods create conditions which lead to disruptions in their daily schedules. While the floods have no direct impacts on their homes, places of work or sources of livelihoods, they lead to lost man-hours and finances. The floods increase conditions such as traffic congestions, causing delays and income losses.

Findings from the research suggest that households with higher incomes are more prone to invest in flood management strategies; low-income households are more vulnerable to the impacts of floods hazards in Nsukka communities. Another observation made in the research findings was that the income and wealth status of respondents before the impacts of hazards and disasters determined their resilience and ability to build-back after disasters. Comparing a male store owner at Ibagwa-Ani community and a widow at Obukpa community whom both have been affected by floods, the researcher observed that income levels and social status help in reducing vulnerability to hazards and disasters. As the male store owner had savings and another source of income (rents from tenants), he could build back his life. The widow suffers as the lack of investments and resources make her more vulnerable to poverty. Wisner *et al* (2004) called these 'dynamic pressures', a lack of resources which will lead to increased vulnerability to disaster risks. For local people like this widow, there is a need for financial support from the government. However, financial support in the form of loans from the

government to help local farmers sustain their businesses or recover from losses is non-existent in Nsukka communities. Several government schemes exist in Nigeria aimed at boosting the farming and agricultural sectors at the national, state and local community levels. Such schemes include the Agricultural Credit Guarantee Scheme Fund of 1978 (ACGSF), Small and Medium Enterprises Equity Investment Scheme of 2001 (SMEEIS), Agricultural Credit Support Scheme of 2006 (ACSS), the establishment of Supervised Agricultural Loans Boards at state level and financing from microfinance banks. However, issues of bureaucracy, corruption, budgetary allocations and policies have led to the inefficiency of these schemes, as local farmers have rarely benefited from them (Eze *et al*, 2010). Efficient communication and information are also essential in the mitigation and adaptation to flood hazards. In January 2012, the Nigerian Meteorological Agency (NIMET) predicted heavy rainfalls that would lead to high surface runoffs and increased risks of flash floods. For Nsukka communities, it was predicted that the rains would begin in April and last till November, which would lead to about 1574mm of rainfall for the year (NIMET, 2012; pg. 13). The agency also predicted increased rainfalls in subsequent years due to the threat of climate change (NIMET, 2012). This turned as to be true as flash floods devastated communities and created vulnerable conditions in various states across the country, Nsukka included. Although NIMET warned the government earlier on, little was done to prepare for the impacts of the coming rains. In local communities, households failed to plan for the impending rainfall as they were not informed by their local governments. In an article for This Day newspaper, Adedoja and Ezigbo (2012) highlighted that the agency wrote to state governors warning them of the increased vulnerability of communities to increased rainfall and potential floods. However, this warning went unheeded resulting in lack of information for local people. Lack of information hinders the ability of the local people to plan for impacts of hazards. Failing to plan for the rainy season could lead to more hazards for local people, leading to displacements and loss of livelihoods and income. It is important to note that in some situations, the members of the community were not to blame for the impacts of flood hazards. Inefficient government installations could lead to flood hazards, as is the case with Alor Uno community, where the drainage system from the University of Nigeria, Nsukka causes floods for house in the community during the rainy season.

Little is known about the impact of erosions within communities in Nsukka. While the erosion within communities in Nsukka might not be as devastating as erosion in neighbouring towns such as Obollo Afor or in communities in states like Anambar and Abia, they have created problems for local people in Nsukka. Minor erosion next to people's houses in rural communities have led to the displacement of families and contributed to livelihood losses. According to respondents, erosion in Nsukka communities were first observed in the late 20th century. Initially, the erosion were minor inconveniences to the local people, but the impacts of environmental and human factors have led to the expansion of erosion in Nsukka communities. Increased rainfall intensity, constant floods and led to expanding erosion in communities. The researcher discovered that not all communities of Nsukka which are affected by floods experience erosions, but respondents in most communities affected by erosions blame intensified rainfall as one of the main culprits. Studies over the years have shown that there is a relationship between increase in rainfall intensity and erosion. Increased rainfall leads to more soil particles' detachment and leads to excess runoff, enabling the onset of erosions and expansion of existing ones (Rose, 1993). There are other factors which lead to erosion in communities, such as the booming sand business in local communities where people dig up sand and sell to builders and developers. This business has led to expansion of gullies in communities and makes households more vulnerable to erosion hazard. The findings from the research suggest that erosion has led to the loss of economic trees such as palm trees and loss of arable commercial farmlands in Nsukka communities. This has contributed to the increased prices of food stuffs in community markets. Agricultural output from local communities is on a continuous decline on an annual basis. In some situations, artificial scarcity is created and prices skyrocket; this threatens food security in Nsukka communities. Soil erosion threatens food security across all regions of the world. Forest, agricultural and pastoral ecosystems are severely affected by the impacts of erosions. It is

estimated that on an annual basis, 75 billion tons of fertile lands are lost to erosion around the globe. Such land losses threaten food productivity and security (Pimmentel and Burgess, 2013; Gomeiro, 2016). Loss of agricultural land to soil erosion is one of the numerous factors which have contributed to increase in global food prices (UN, 2011). The rapid increase in the prices of basic crops such as maize, wheat, soybeans, rice and cooking oils especially in developing countries negatively affect local people (FAO, 2009b). The higher food prices force household to spend more on food. Households with limited resources end up with diminished nutrients intake which could lead to malnutrition, a situation that has been observed in countries like Ethiopia and the Central African Republic (Swan et al, 2010). Erosion has led to displacement of families in Nsukka communities. For some respondents, the displacement of their families takes away their family heritage from them. There are suggestions from the findings that the state and local governments have assisted in erosion mitigation in Nsukka communities. However, the assistance from the government has been insufficient and non-existent in most communities. The local people avoid the erosion sites and use traditional methods to adapt to the impacts of the erosion hazards. Using traditional methods of control such as the use of bamboo controlled the expansion of the erosion in Nsukka communities in the past. However, increased impacts of environmental and human factors such as increased rainfall intensity, drier weather and digging up soil has made the bamboo planted in the past insufficient in managing the spread of gullies. Soil erosion is one of the most potent threats to the sustainability of the environment and creates vulnerability in local communities. Over 10 million hm^2 of arable land across the world is lost to soil erosions every year. The value of using bamboo for erosion control has been recognised by various communities in various parts of the world (Zhou *et al*, 2005). From the mountain regions of Japan to communities in Brazil, bamboo plants have been used to check erosions and improve the structure of the soil (Fu *et al*, 2000). With a network of extensive fibrous root system, connected rhizome system and leaves which helps in protecting soil from intensive rainfall, the bamboo is an essential plant for land sustainability in communities of Asia and Africa (Zhou *et al*, 2005).

The bamboo plant is found in many communities in the South and Middle Belt regions of Nigeria and is one of the most widely distributed plant resources in the country (Ogunwusi and Onwualu, 2011). The stems of the bamboo plant are used mostly for building and construction, especially as scaffolding and building materials in different areas of Nigeria. As a cheaper substitute for wood and steel, the stems of bamboo can be used in roofing, flooring and the reinforcement of structures (Ogunwusi and Onwualu, 2011; Atanda, 2015). However, it has been argued that the plant is not properly utilised in the country. The plant is environmentally-friendly and could be used more widely in infrastructure development, as a substitute for wood, which are usually obtained by cutting down economic trees such as palm trees and melon trees. The exploitation of wood in Nigerian forests is unsustainable and could lead to environmental disaster in the future (Atanda, 2015). While bamboo has provided some economic benefits in Nigeria and even led to the establishment of bamboo processing plants in some parts of the country, it has not been extensively used in the management of erosion hazards. Due to the availability of bamboo in local communities in South-East Nigeria, farmers use bamboo culms as plant stakes to help plants like yams and cocoyam grow (notice the bamboo culms and stems in Plate 6.11) (Ogunwusi and Onwualu, 2011). In the few existing locations where bamboo has been planted in the communities for erosion control, it had been done in past decades and there is evidence that the knowledge has not been handed down to current generations. In questionnaires used as part of this study, the researcher found that in the returned fifty-six questionnaires, fourty-two respondents did not know any local materials which could be used in managing environmental hazards in their communities. This represents an overwhelming 75% of the questionnaires' respondents. The importance of bamboo as a necessary measure in natural hazards management in local communities has been shown in Asia, where the Asian Development Bank funded a project aimed at the planting of bamboo for erosion control in communities in Indonesia which has been successful to some degree (Asian Development Bank, 2010).

Most respondents believed that changes in nature and weather patterns are the leading causes of natural hazards in the communities. However, some respondents believed that the hazards experienced in the communities are punishments from a Supreme Being because of the 'sinfulness' of the local people. The idea that hazards and disasters are curses or punishments from the 'gods' is not an alien one, as it has been reported in different communities across the world. The interpretation of disasters in traditional religions dates back to historical times. In Africa, some indigenous communities in East Africa, the Nile and Sudan continue to believe that earthquakes are a result of tremors caused by the restless dead in the underworld (Chester et al, 2012). While the perception that erosion is a warning or 'curse' from the 'Gods' may seem far-fetched, it might have helped in preventing fatalities. For farm owners in the community who were traditionalists at that time, abandoning their farms at onset of erosions might have given the land time to recover from the impacts of continuous farming. Local culture enables efficient communication at Nsukka communities and has helped reduce the vulnerability of households to hazards. The 'Umunna' and 'Umuada' system provide platforms which help households recover from the impacts of hazards in Nsukka communities. However, the local culture has also contributed to vulnerability, especially in households headed by women. The culture makes it impossible for women to directly own lands in Nsukka communities as they must obtain land through a male relative. This has left some Nsukka families without any livelihood sources and makes them vulnerable.

Communities in Nsukka are threatened by constant heatwaves which has affected the whole country. The risk of meningitis spreading across the country during the constant heatwaves is a serious threat. There has been links made between the increasing heatwave and cerebro-spinal meningitis (CSM). Cerebro-spinal meningitis is a respiratory disease which is contagious. CSM epidemics were first observed in Africa in the 19th century and it keeps returning to communities across the continent. The bacteria which cause the disease can be transmitted from one person to another through throat and respiratory secretions. Dry winds, hot weather, crowding at public places like the market and lack of ventilation could lead to the spread of the bacteria which causes meningitis (Codjoe and Nabie, 2014). In early 2015, the Nigerian government through the Federal Ministry of Health notified the World Health Organisation (WHO) of suspected outbreak of meningitis in Nigeria. The World Health Organisation responded by providing vaccines to be administered to the Nigerian population (WHO, 2015: 2). In Nsukka communities, the vaccines have been difficult to find and in where they have been found, those who are supposed to administer the vaccines for free are selling them to the local people. Most local people in Nsukka were not interested in paying for the vaccines as they believe that since they have not heard of the meningitis disease in Nsukka at the time of this research, there was no need in using scarce resources to pay for the vaccine. These heatwaves experienced across the country is due to the impacts of climate change across the country. The situation is worse in the Northern part of the country and encroachment of the Sahar Desert and drought. These conditions have forced herdsmen to migrate to the Southern region of Nigeria with their herd, seeking fresh pastures.

This migrating of Fulani herdsmen to the South has led to conflicts with farming communities in Nsukka. Although it is easy to blame the Fulani herdsmen for creating conditions which lead to these conflicts by grazing on community farmlands, it is important to note that the reason why these conflicts are becoming regular is the migration of the herdsmen from the North. This migration is caused by changing climatic conditions which cause continuous drought, desert encroachment and diminishing resources in Northern Nigeria. Climate change has led to depletion of food sources in Northern Nigeria for members of communities as well as for their livestock. Droughts, crop failures and desertification have led to famine in various communities and the need to migrate to areas where resources might be available for man and livestock leads to conflicts (Purvis and Busby, 2004; pg. 72). The Fulani herdsmen are driven down to the South due to the depleting environmental resources in the Northern region of the country. With the impacts of climate change continually on the rise, these migrations will continue into the future. The theory of eco-violence has been used to argue the

reasons for conflicts between the herdsmen and communities like Nsukka in the South of the country. The ideology is that communities depend on four major natural resources: cropland, fresh water, fish and forests. Depletion of these vital resources in communities due to degradation or misuse would lead to conflicts under certain circumstances (Homer-Dixon and Blitt, 1998). Climate change affects the availability of these four resources. Seas and rivers have dried up due to drought and rising temperatures; desertification has affected arable farmlands, pastures and forests. These lead to migration which causes competition for resources, resulting in conflicts. The neglect of agriculture as a valuable source of national income by the Nigeria government (in preference to crude oil) has led to low levels of interest in climate change adaptation and mitigation by the Nigerian government. The impacts of climate change have led to scarcity of food resources and overplanting to balance scarce resources has led to loss of pastoral lands (Odoh and Chilaka, 2012); hence the continuous migration of the Fulani herdsmen from the North to the South, with increased risk of conflicts (eco-violence).

10.3: Summary of Assets and Vulnerabilities:

Assets (or capacities), as defined within the sustainable livelihoods approach, include all tangible and intangible resources available to people to use in building their livelihoods. These livelihoods assets are natural, human, social, physical and financial assets (Krantz, 2001). For respondents in Nsukka communities, these assets are essential for reducing vulnerability to hazards in their daily lives. Some of these assets already exist to some extent within some of the Nsukka communities. However, there are some gaps which need to be filled as they cause vulnerabilities in these communities (Table 10.1). Within the 17 Nsukka communities that participated in this research, specific assets which have helped in adaptation and mitigation were identified by the researcher. These assets have helped reduce the vulnerability of families to the different hazards they could be exposed to daily. Through the responses of the respondents, the researcher also identified various deficiencies that could exacerbate or contribute to increased vulnerability to hazards with the communities. The capacities (assets) and the vulnerability conditions differed from community to community.

Table 10.1: Capacities and Vulnerabilities in Nsukka communities

CAPACITIES	VULNERABILITIES
Natural Assets	
- Land is abundant in Nsukka communities. Families inherit lands and cultivate on them. There are available lands for purchase in all the communities.	- Women are not allowed to buy lands in Nsukka communities unless through a male relative or representative at Opi-Agu community.
- Local streams and rivers exist in the communities which provide water for carrying out chore in community households. The local streams and river could also provide food sources (fish) for the poor in communities.	- Research has shown that water bodies in Nsukka are contaminated by faecal matter and microorganisms. The defunct Water Board make local people in the communities more vulnerable.
- Nru community is blessed with palm trees and is considered as one of the highest producer of palm oil in Enugu state.	- The floods and erosions on Nsukka communities lead to severe loss in land resources. Losses in economical trees form these hazards have caused prices of commodities such as palm oil and palm wine to continually rise.
	- Slow-onset erosion is leading to loss of economic trees in Nru community. A number of local farmers in Nru depend on palm oil processing and sale for their livelihood.
Physical Assets	
- Linking roads exist from all the communities to Nsukka town and to other parts of Enugu state.	- Most the local roads in all the communities are untarred and during the rainy season, movement is limited. This affect people going to farms, reducing man-hours essential to building livelihoods.
- Within the communities, access to farmlands is usually done on bicycle; the availability of commercial motorcycles in the rural areas reduces the challenges of moving from one community to the other.	- At Opi-Agu, Ibagwa, Agu-Echara, Onuiyi and Owerri-Ani communities, there is electricity, although its supply is small, leading to some burning of

- Electric poles and electric connections exist in most of the communities. - Communal housing exists in Nsukka communities. At Opi-Agu, Agbamere, Edeoha, Edem and Nru communities, it was observed that extended families live together in the same compound. - Farming tools are cheap in Nsukka communities (for instance, a local hoe costs N600 at a local market at Agu-Echara); this means that anybody can take up subsistence agriculture if they have readily available land.	charcoal and firewood to produce energy. At Akpotoro, Eha-Ndiagu and Agbamere communities (which are farther from Nsukka town center), some families have not been connected to electricity for years. There is heavy reliance on burning of firewood, dry leaves and charcoal to produce energy. There seems to be a constant burning smell in the air around Eha-Ndiagu community which could lead to respiratory problems. - Large-scale farming in local communities is declining due to natural hazards and the rising costs of fertilizers. At Edem community, households have to rely on chicken and pigs dung mixed with compost as manure for growing crops for commercial purposes, as they cannot afford fertilizers.
Social Assets	
- In all Nsukka communities, there is total social inclusion for all family members when they become adults through the 'Umunna'* and 'Umuada'** social units. These units provide a platform for community representation and decision-making. - Families tend to live close to each other. This creates a bond among the children which stays on for life. There is the spirit of 'oneness' among families in Nsukka communities (unless in cases where there is family dispute). - There is respect for the decisions of elders and reverence of tradition in all Nsukka communities. This leads to level of orderliness in households and the communities in general.	- There is an unequal balance of power between the 'Umunna' and 'Umuada' social units. The women must seek the opinion of the men before decision are taken on any issues in the communities. Traditional knowledge is also withheld from women, as men in Nsukka communities identify as the custodians of local knowledge. - Some traditions in Nsukka communities make women more vulnerable than men. At Akpotoro, Nru and Agu-Echara communities, women's heads are shaved off their hair following the death of their husbands, using a razor blade. This exposes women to infectious diseases. Nsukka women are also born into the tradition that they would go mad if they have adulterous affairs. The men are allowed to do as they please, increasing the chances of Nsukka women contacting diseases from their husbands.

- Local vigilante outfits exist in Nsukka local communities to protect all members of the communities against crimes. In Umunnedem-Ameni and Ede-Oballa communities, every extended family has a representative in the local vigilante outfit. This ensures that bad elements in some households are always monitored.	
Financial Assets	
- Some families in Nsukka communities, especially those who inherited farmlands which are not affected by natural hazards, grow their own crops and are able to save up some money to tackle our issues in their daily lives.	- The national minimum wage is low at N18,000. In reality, it is insufficient for households. There is no investment in hazards management for the future due to insufficient financial resources.
- Community members who worked for the government are entitled to pensions.	- Community members who worked for the state and local governments receive their pensions every other month; in Nru community, the head of a household had not received his monthly pension for 7 months.
- Some households partake in a practice known as 'contribution'. This is situation where relations or villagers form a small group and contribute some amount of money into common fund every month. By rotation, every contributor gets to take home the whole money from the fund every month. Such initiatives help families tackle vulnerabilities and provide their needs.	- Loan facilities from banks and the government are not available at all the communities. Local loaners exist at Opi-Agu and Edeoha communities but problems associated with repayment of loans make it difficult for people to loan money to others.
Human Assets	
- In Nigeria, the Universal Basic Education scheme ensures that pupils attend government public schools for free, only needing to pay for school uniforms and books. This is applicable to Nsukka communities as well.	- The public schools in Nsukka communities are in terrible conditions (Plate 10.1). Teachers in these public schools are not properly trained and as they receive low incomes, they rarely show up to work. At Nru community, parents prefer to send their children to work on their farms even on school days.
- Bush meat provides valuable nutrients to members of Nsukka communities. Grass-cutter (*nchi*) and wild pigeons (*okwa*) are	- From the researcher's observation,

readily found in local bushes. At Obukpa community, some households set traps to catch small wild monkeys (*enwe ohia*) which are a local delicacy. The rainy season also leads to the abundance of edible flying termites (*aku*) and snails (*eju*).	income levels determine the level of education a child might attain. Children in poor households struggle to finish primary school education (even though it is free for public schools). - One of the reasons why Ebola gravely affected African communities is the dependence on bush meat in local communities. Bush animals are vectors for tropical diseases such as Ebola which affect humans (Karesh and Noble, 2009). However, locals in Nsukka communities are highly dependent on these bush meat as beef and chicken are expensive alternative sources of protein.

Source: Author

Plate 10.1: Inside Community School, Nru, Nsukka

Source: Author

The findings show that the family unit is the most essential asset and its advantage is that it is always there. For women however, the family unit which provides a sense of belonging is not fair to them due to cultural and traditional norms. This creates vulnerability especially for the women in Nsukka communities. The NYSC EMVs program has been very successful in the South-East of Nigeria, including in Nsukka communities. In 2014, South-East NEMA trained 500 youth corps members across all the states in South-East Nigeria. According to the director of NEMA South-East at that time, the need to shift the focus from disaster relief to disaster prevention, mitigation and preparedness has led to the development of structures such as the EMV project, to help take government disaster management to the community level and help in response to disaster situations in communities (Uzodinma, 2014). This is in line with Priority 4 of the Sendai Framework for Action (UNISDR, 2015). Training of 300 EMVs also took place in Abia and Imo states in 2015 (Udeajah, 2015). The EMV project has become an essential part of disaster education and awareness for local communities. Floods awareness, disaster and control measures campaigns across different communities in all regions of the country are the most recent proactive measures undertaken by the EMVs project (NEMA, 2015; 2016). Since the inception of the project in 2008, it is estimated that over 6,000 youth corps members have been trained in about 23 states of the country. The project has also created a platform for unemployed graduates who have had training in disaster management as youth corps members, to participate in disaster risk reduction strategies as paid volunteers. Such volunteers are employed to educate their local communities and the general public on how to reduce vulnerability to the impacts of hazards and how to protect themselves in the event of a disaster (Sadiq, 2012).

11.0: DISCUSSION, CONCLUSION AND RECOMMENDATIONS

11.1: Introduction:

This thesis has been written from different interdisciplinary approaches to understand the perceptions of the people in Nsukka communities towards the hazards they face in daily life. The thesis highlighted strategies used to reduce vulnerability at the local community level and the impact of government strategies; the thesis also showed how inadequacies from the community level, up to the federal government level are keeping communities at perpetual vulnerability. The starting point of the research was to highlight the concept of ethnicity and disasters in communities. Ethnicity could mean different things, depending on the context in which the word itself is used. The context adopted by the researcher is the use of cultural indicators such as local beliefs, knowledge of community and adaptation to the community. The perceptions of people who make up a particular ethnic group and residing in a particular area, influences the way they respond to challenges in their daily lives (Allen, 1996). For the people in Nsukka communities, local beliefs, religious beliefs and local traditions influence their vulnerability to new and pre-existing hazards. The thesis showed that for the Nsukka man or woman, the most important step towards disaster risk reduction is ensuring continued access to livelihood assets. The thesis also showed how the members of Nsukka communities view government initiatives in their communities, while exploring how the people perceive the Nigerian government's duty of keeping communities safe and ensuring improved livelihoods.

From the research, it was observed that what keeps people vulnerable to hazards and disasters at the community level is the lack of access to essential assets, which would help them become resilient to hazard impacts. There is a link between government policies, accountability of politicians and continued hazards in the communities. The people in Nsukka communities show a high level of distrust for the government and prefer to manage hazards and disasters using their own methods, as they believe their complaints to the government will always fall on deaf ears. This research has shown that the general conditions of corruption across Nigeria trickle down to Nsukka communities as well. The people in Nsukka communities go about their daily lives, striving to provide for their households daily. The unpredictable Nigerian economy has created a situation whereby investment in hazards mitigation at the local level is very low; people prefer to take the risk of living with hazards and adapting than investing scarce resources on hazards mitigation initiatives. This chapter will be divided two sections. The first section will be on discussion and conclusion, while the second section will present the researcher's recommendations. These questions will be obtained from the initial aims and objectives of this research, as the answers to the questions will be discussed from the findings. The final part of the thesis will recommend strategies for effective DRR.

11.2: Discussion:

The first step in summarising and discussing the findings from this research would be to refresh our minds on what the researcher set out to achieve in the first place. This thesis is based around three research questions:

- How do local perceptions and traditions influence hazards and DRR in Nsukka and environs?
- How do livelihood assets influence disaster decision-making for community members in Nsukka and environs?
- How do current coping strategies by the government support or deter DRR/how do these fit in line with the HFA and SFDRR objectives?

From these questions, specific questions will be isolated and discussed.

Question 1: What do the people of Nsukka perceive as hazards?

The findings in the research suggest that people from Nsukka communities have different definitions of what hazards are in daily life. Two separate definitions were identified and these definitions are based on the perceptions of individuals. For some respondents, hazards are conditions which make lead to difficulties in carrying out daily businesses while for others, hazards are situations which could cause harm, affect lives and livelihoods in a negative way. These conditions could be flooded roads, erosions, lack of portable water, minimum wage and heat waves. All these, from the perspectives of some people in Nsukka communities, could lead to disasters. Flooded roads could limit movement of people, preventing access to means of livelihoods. Diminished means of livelihoods make households vulnerable as there are no resources to mitigate the impacts of other hazards. Lack of portable water could lead to disease outbreaks in local communities and with the minimum wage being very low, incomes for households would struggle to take care of the sick and infirm, while trying to feed. Although minimum wage could be argued as a condition which exacerbates the vulnerability of people to hazards, the Nsukka people see it as a hazard itself because it is barely enough for a household of one, there is the possibility that children could starve in large households; that then becomes a disaster.

Question 2: What is the influence of beliefs, traditions and culture on hazards and DRR?

In Nsukka communities positive and negative influences of traditions on hazards and disaster risk reduction were identified. On the positive side, there is a sense of brotherhood among all communities. Every child born in these communities grows with this brotherhood spirit (‘*obinwanne’* in the local language). Local tradition requires that one has to be a shoulder for one’s relation to lean to, when such relation is affected by hazards. There is also the culture of listening to elders, whose wisdom shape the laws of the land and keep people safe. On the negative influence of culture, the refusal to sell lands in some Nsukka communities may lead to more vulnerability to hazards. There are families where women are the head of the home. The local tradition and culture refuse to acknowledge that women could be head of households. Some members of the community who believe that the hazards experienced in their daily lives are caused by deities or ‘sins’ of the people will continue to be vulnerable to hazards in the community. Research has shown that hazards are caused by environmental conditions or human-errors and the condition of vulnerability increases the risk of hazards leading to disasters. While research has shown that the increase in disasters across the globe is due to changes in climatic conditions and impact of humans on the environment in which they live in, traditional and religious beliefs will continue to shape the perceptions of local people. These beliefs form the base for people’s cultural identity.

Question 3: How important are livelihood assets in households?

In all the Nsukka communities, the importance of livelihood assets was identified. Local knowledge forms a huge part of adaptation to hazards in the local communities. Knowledge passed down through generations, such as the knowledge of bamboo plants in erosion control and planting methods learned from relations, go a long way towards help generations survive in the face of hazards in their communities. Social relationship such as with the extended family system helps in hazards recovery at the local households. These social relationships ensure that people at the local community have a sense of belonging, which goes a long way in reducing vulnerability to hazards. These relationships breed grounds for respect and trust in older ones, which help younger generations learn important lessons on continuity in the community. Local laws and customs implemented by elders check the excesses of members of the communities, thereby creating a platform for disaster risk reduction. Natural resources such as land helps create income for the local people and could be an avenue for keeping families fed. Water resources such as streams and rivers help the local people adapt to the lack of portable water. However, water resources could also pose threats to local households due to the presence of microorganisms. The most important livelihood needs identified by the people in Nsukka communities was money and monetary incentives. Avenues for income generation are very important at the local level because investing disaster risk management strategies is impossible without having income. The lack of loan facilities and a poor minimum wage increases the possibility of families being affected by the impacts of hazards.

Question 4: Is the government doing enough for DRR in Nsukka communities?

The most significant government strategy initiated by the government for local communities has been the EMVs Project. The project has brought disaster risk education and awareness to local communities. Apart from this, there is little that is done to mitigate hazards in Nsukka communities. The NEWMAP initiative that deals with erosions in different communities in Enugu state does not include Nsukka communities. While the project is based on controlling large erosions which have led to loss of communal lands over decades, it is important to mention that erosions which have the most impacts on households are those located next to people's houses and in farmlands. It is important to manage and curtail the expansion of large erosions sites; however, it is even more import to manage erosion and hazards closest to local people, hazards which lead to loss of livelihoods and creates increased vulnerability. Corruption, politics and institutional power play makes it difficult for credible work to be achieved in disaster risk reduction at Nsukka communities. The government's reluctance to invest in hazards mitigation strategies, preferring to carry out minor relief after disaster strikes creates more vulnerability in Nsukka communities. Concerned stakeholders who should be working together for disaster management to be efficient from the community level up to the international level do not work together; some of these stakeholders do not even understand what their roles and responsibilities should be. These points show that the Nigerian model of disaster risk reduction is a long way off from the recommendations of Hyogo and Sendai Frameworks, respectively.

11.3: Conclusion and Recommendations:

There is a need to improve disaster risk reduction from the community level. Changing the perceptions of the local people towards the government and towards hazards should be the starting point of efficient disaster risk reduction from the community level. For this to happen, different steps need to be taken by the government and the local people:

1. The fight against corruption should be extended to ministries and parastatals that work in local communities. There should be improved vigour on the side of the government to enforce accountability of elected community representatives. When there is a project in the community, the government should ensure that every naira is accounted for.

2. The government needs to complete the vulnerability and capacity assessment (VCA) of all the local government areas in the country. The reason why government does not know how people suffer in local communities due to the lack of constant assessment of new and pre-existing hazards and no documentation. The government and stakeholders have the general knowledge that different regions in the country experience different hazards. However, they do not know just how the hazards lead to other hazards in local communities.

3. Information about hazards and potential hazards should be made available to community chiefs and leaders at all times. As seen in the case of the floods of 2012, the impacts were very heavy across the country because state governments did not share information they obtained from NIMET, to local communities. A pathway of hazards information should be created established from federal government to state government, to local government and then community leaders, who would brief the local people and take their perceptions back through to the federal government. Not only would this provide valuable information for communities and government, it would also lead to a continuously-improving disaster management framework for the country.

4. The government should expand the EMVs Program to include the local people, making the locals champions of hazards and disasters management in their local communities. The current EMVs Program is not totally sustainable, as Youth Corps members undertake the service for one year and move on. It is then left for incoming Youth Corps members to start up all over again another year. Drafting local community members in the EMVs Program would ensure continuity in disaster management at the local level. Community EMVs would go on to share knowledge around the community, knowledge which would lead to efficient DRR strategies when combined with local knowledge.

5. During the construction of roads and other development initiatives in local communities, a study of the land should be made. Lands are inherited across generations. Every new generation brings about more development and expansion, as people build houses, roads and industries in local communities. There is a need to create an extended community map, readily available to all members of communities, from their local government council offices. This map should contain the topology and geophysical make-up of community lands. This

would give developers and builders an idea of how development projects should be carried out in such communities, to prevent future hazards caused by development.

6. DRR courses should be adopted into school curriculums, across the country. Educating children from the primary school level up to the university level on the impacts of hazards in their communities and the country in general, would make the future generation hazards aware. Hazards awareness goes a long way towards ensuring vulnerability reduction in local communities.

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APPENDICES

APPENDIX 1: Research Consent Form (Content)

Research Statement and Consent Form for Research:

My name is Nnamdi Gregory Iloka. I am conducting my PhD research in the Faculty of Engineering and Environment, Northumbria University, in the United Kingdom. My research topic is: **Perceptions of Ethnicity, Local Knowledge and Sustainable Livelihoods in relation to DRR: The case of Nsukka in South-East Nigeria**.

This research aims to understand how people's beliefs and culture influence hazards, making them escalate or not to escalate into fully blown disasters. The research also aims to understand how livelihoods influence hazards in households in local communities. The United Nations office that is responsible for disasters reduction – UNISDR (United Nations Office for Disaster Risk Reduction) – had a conference in Hyogo, Japan in 2005, where the Hyogo Framework for Action was developed. This framework is aimed at guiding member nations towards ensuring a substantial reduction in disaster losses that occur in their countries.

Nigeria, being one of these member nations, have been submitting progress reports to the United Nations that contain the progress made in this area. However, there is a need to understand how the local communities have been managing disaster risks over the years; there is a need to understand how local measures and strategies have kept generations safe from disasters. An integration of this local knowledge with the scientific knowledge would ensure a complete framework that will involve all key stakeholders involved in disaster risk reduction. This will ensure that there is a more direct relationship between the individuals at both ends of the ladder.

I look forward to working with you and learning from your wealth of knowledge. Many thanks for your cooperation.

Nnamdi Gregory Iloka

E-mail: nnamdi.iloka@northumbria.ac.uk

Personal Information and Details

This research will not gather any of your personal details or contact information. The research will gather information about your experiences and knowledge related to the topic. Outcomes of this research will open to you, if you wish to see the completed work.

Option to Opt-out from this Research

As a participant in this research, you have the authority to opt-out from this research anytime by e-mailing me. You are not bound by any law to participate in the research.

Additional Information

Before we start the interviews, we will spend some time going through details to provide you with any additional information you may need regarding the research. Please use this time to seek clarifications of any questions you have.

PERCEPTIONS OF ETHNICITY, LOCAL KNOWLEDGE AND SUSTAINABLE LIVELIHOODS IN RELATION TO DRR: THE CASE OF NSUKKA IN SOUTH-EAST NIGERIA

Northumbria University, United Kingdom, NE1 8ST

Informed Consent Sheet

I have read and understand the purpose of the study	
I have been given the chance to ask questions about the study and these have been answered to my satisfaction	
I am willing to be interviewed	
I am willing for my comments to be tape-recorded	
I understand that I can withdraw at any time if I change my mind and this will not affect my treatment/education/care	
I am aware that my name and details will not be collected and will not appear in any printed documents.	

This information will be held and processed for the following purpose(s):

PERCEPTIONS OF ETHNICITY, LOCAL KNOWLEDGE AND SUSTAINABLE LIVELIHOODS IN RELATION TO DRR: THE CASE OF NSUKKA IN SOUTH-EAST NIGERIA

I agree to Northumbria University at Newcastle, United Kingdom, recording and processing this information about me. I understand that this information will be used only for the purpose(s) set out in the information sheet supplied to me, and my consent is conditional upon the university complying with its duties and obligations under the Data Protection Act 1998.

Name:

Signature:

Date:

APPENDIX 2: Open-Ended Questions

OPEN-ENDED QUESTIONS FOR FIELDWORK

Name:
Occupation:
Community:

1. What do you understand as hazards?

2. What would you classify as hazards in your daily life within the community?

3. Have you been affected by any of these hazards?

4. What platforms installed by government (local, state or federal) help in the management of these hazards in the community?

5. How are the concerns of the community communicated to the government?

6. Is there a way government compensates those affected by these hazards?

7. Without the help of government, how do you manage these hazards with your own knowledge?

8. How does the community assist those who have been affected by these hazards?

9. How does local hazard management create job opportunities for local people?
10. What 'laws of the land' or taboos are associated with how hazards managed locally?
11. How have these laws or taboos help minimize or increase the risks of hazards?
12. What are the customs and traditions of this community?
13. How are these customs and traditions passed down from one generation to the next?
14. What influence do these customs and traditions have in the management of hazards?
15. What are the resources most needed for one to live a fulfilled life within this community?
16. How have these resources helped you in managing hazards?
17. How have these resources influenced how you make decisions relating to hazards?
18. What has been learnt from the impacts these hazards have caused in the past?
19. How has the lessons learnt from the past been put into practice in recent times?

20. Is there anything you would like to add to these?

APPENDIX 3: Questionnaire for National Youth Service Corps Members

QUESTIONNAIRE ON HAZARDS AND DISASTERS IN COMMUNITIES DISASTER MANAGEMENT CDS YOUTH CORPERS (FOR RESEARCH BY NNAMDI GREGORY ILOKA – POSTGRADUATE RESEARCHER, NORTHUMBRIA UNIVERISTY, NEWCASTLE, UNITED KINGDOM).

NAME:

(Please tick as appropriate)

1. What region of the country are you from?
   - ☐ South-East
   - ☐ South-South
   - ☐ South-West
   - ☐ North-Central
   - ☐ North-West
   - ☐ North-East

2. Are you familiar with the hazards in the local community of your primary assignment?
   - ☐ Yes
   - ☐ No

3. How are the hazards managed in the local community?
   - ☐ Government manage hazards to prevent disasters
   - ☐ Local people manage hazards to prevent disasters
   - ☐ Government and local people work together to prevent disasters

4. Do you participate in hazard and disaster management in the community?
   ☐ Yes
   ☐ No
5. Have you been part of any training on hazards and disaster management organised by NEMA?
   ☐ Yes
   ☐ No

6. Are there any hazards information or programmes available for the local community?
   ☐ Yes
   ☐ No

7. How important is it to create awareness about hazards in the local community?
   ☐ Very Important
   ☐ Quite Important
   ☐ Not Important

8. How well do you speak and/or understand the local dialect?
   ☐ Very well
   ☐ Quite well
   ☐ I do not speak well but understand
   ☐ I do not understand well but I speak Igbo language
   ☐ I do not speak nor understand Igbo language

9. How important is local knowledge in hazards management in the community?*
   ☐ Very Important
   ☐ Quite Important
   ☐ Not Important